BULLETIN

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Chicago Natural History Museum

February

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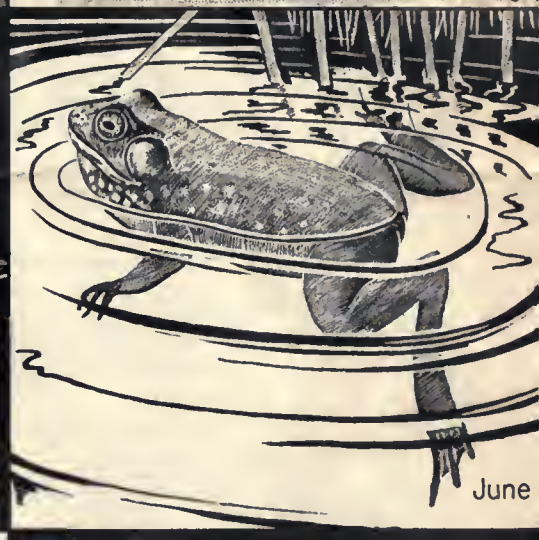
April

May



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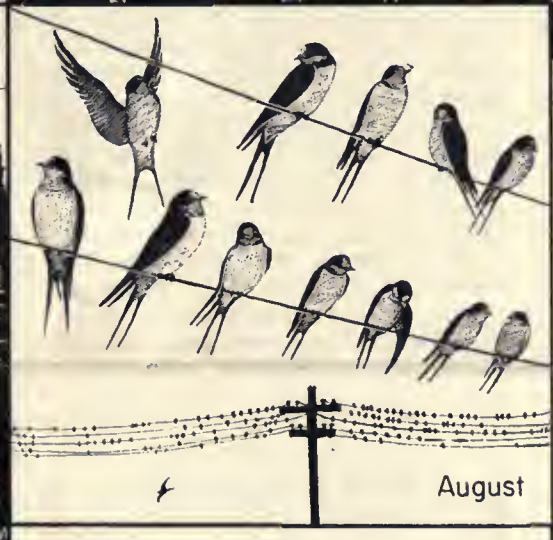

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Members are requested to inform the Museum promptly of changes of address.

THIS MONTH'S COVER—

The BULLETIN opens the New Year with a calendar of Nature on its cover depicting some characteristic phenomenon for each month of the year. Elsewhere in this issue is an article by Karl P. Schmidt, Chief Curator of Zoology, on the history, philosophy, and significance of naturalists' calendars. The observation of seasonal changes is the basis of much of our science and the starting point for the careers of many men eminent in research.

The cover calendar, executed by Staff Illustrator Douglas E. Tibbitts, represents subjects appropriate to the various months: for January, snowflake crystals; for February, the hibernating striped gopher; for March, hepatica flowers and early tree frog (spring peeper); for April, the meadowlark; for May, the white trillium; for June, the bullfrog, the last of the frog voices to be heard; for July, the small-mouth black bass; for August, barn swallows gathering for their southward migration; for September, the monarch butterfly; for October, the gray squirrel harvesting nuts; for November, a cock pheasant in flight; and for December, the winter stars over a white spruce, one of the more familiar Christmas trees.

Sponges, sea stars, corals, and other marine invertebrates are displayed in Hall M.

NATURE PHOTO CONTEST JUDGES APPOINTED

Three members of the staff of Chicago Natural History Museum have been named among the five judges for the Fifth Chicago International Nature Photography Exhibition. They are: Emmet R. Blake, Associate Curator of Birds; Dr. Julian A. Steyermark, Associate Curator of the Herbarium; and Robert K. Wyant, Curator of Economic Geology. The other two judges are William Dennin and Harry Langer, F.R.P.S., A.P.S.A., both well-known professional photographers.

The exhibition will be held in Stanley Field Hall of the Museum from February 1 to 28, inclusive. Deadline for entries, which may be sent to the Museum, is January 16. Entry forms may be obtained from the Museum or from Mrs. Louise Broman Janson, 6252 South Kedzie Ave., Chicago 29.

The exhibition will be conducted in accordance with recommendations of the Photographic Society of America and accepted contributors will be eligible for listing in *Who's Who in Nature Photography.*

The exhibition will be in two divisions, prints and transparencies, with an entry fee of $1 in each. No more than four entries may be submitted in either division.

There are three classifications in each division. They are: A. *Animal Life*—animals, birds, insects, tracks, nests, etc. (no domestic animals); P. *Plant Life*—flowers (except formal arrangements), trees, shrubs, fungi, etc.; G. *General*—scenery, geology, clouds, etc.

Prints must be on 16" x 20" mounts. They may be in monochrome or color and any size up to that of the mounting. Each must be entirely the work of the individual contributor and must show *on the back* title, classification, and maker's name and address. Untitled prints will not be accepted.

Color slides or transparencies should not exceed 3¼" x 4" and must show title and maker's name and address. Slides may be in glass or cardboard but glass is recommended. Glass over cardboard will not be accepted. Each must be spotted in the *lower left-hand corner.* Larger transparencies should be in cellophane envelopes if not bound.

Immediately after judging, notices will be sent to each contributor. A catalogue will be sent at the close of the exhibition. All accepted prints and slides will receive stickers. All contributors will receive the *Exhibition Bulletin* for a year. A number of accepted entries will be reproduced in the Museum BULLETIN, the *P. S. A. Journal,* and elsewhere. Permission for such reproduction is presumed unless there is notification to the contrary.

Silver medals and ribbons will be awarded in the various print and slide classifications. All winners will receive the Museum BULLETIN for a year, and their names will be inscribed on the Myrtle R. Walgreen plaque on display in the Museum.

Utmost care will be exercised by the Camera Club and the Museum but no responsibility is assumed for lost or damaged entries. All entries will be returned to owners prepaid immediately after close of the exhibition. Or, if owners so direct, they will be forwarded to any other exhibition indicated.

BOOK SHOP OFFERS NATURE CALENDAR

The BOOK SHOP offers an attractive 1950 nature calendar for the wall in home or office. It is spiral hinged, opens to 8¾ x 21 inches, and contains 12 full-color illustrations from Kodachrome photographs of plants, animals, and people. Price $1.

Also available is the American Calendar for 1950. This 104-page engagement book has 52 full-page reproductions of the work of well-known photographers plus a frontispiece and cover in full color. Price $1.25.

Bulletin Comes of Age

With this issue, the BULLETIN begins the 21st year of its existence and its 21st volume. In its first twenty volumes it has covered all Museum events since its initiation in 1930. It also printed, in its first two volumes, a brief history of the Museum recording all the principal developments of the institution before the inauguration of this periodical.

NEW MEMBERS

The following persons became Museum Members between November 16 and December 15:

Associate Members

James A. Erickson, Christopher D. Norton

Sustaining Members

Willis H. Scott

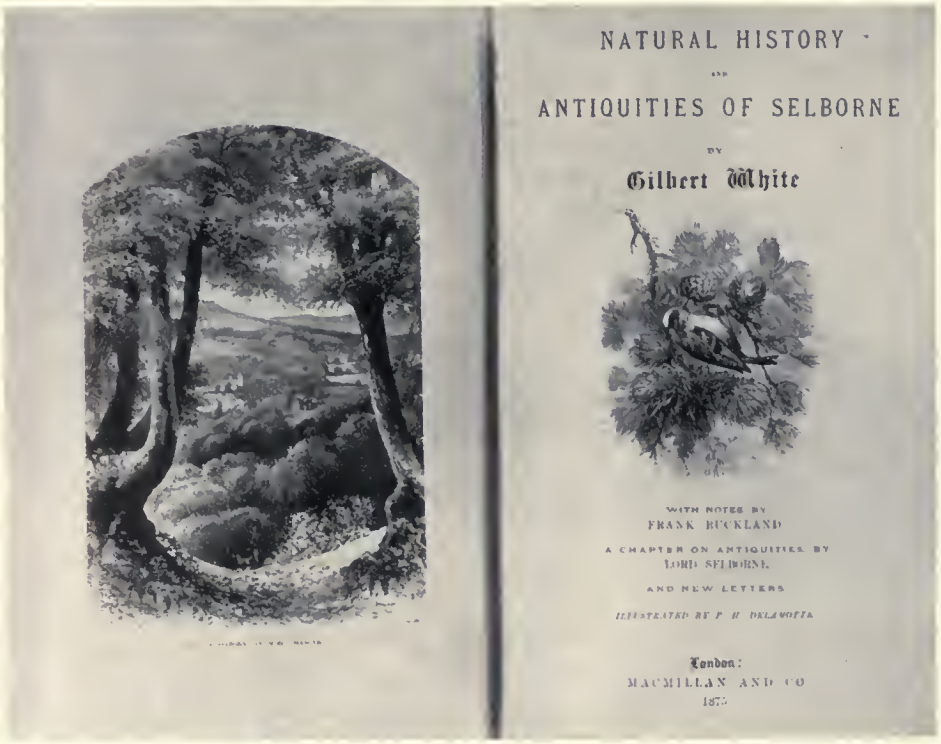
Annual Members

John R. Walsh Baldwin, Ralph Austin Bard, Jr., John T. Beatty, Louis E. Bohlin, Mrs. R. W. Cornelius, Dr. Maxwell Gitelson, Gordon L. Glassford, Harold V. Glen, George W. Harvey, Jr., Frederick W. Hawley, Jr., Max Homan, Lester B. Knight, F. Willis McGuire, Dr. Rose Menendian, R. R. Minor, A. E. Patton, C. D. Pettingell, Andrew Pettinger, Dr. Gerhart Piers, W. J. Reilly, Miss Forsythe Render, John W. Rose, Walter D. Rudolph, William R. Ruehlmann, Dr. Winfield W. Scott, Dr. W. Walter Sittler, Lendol D. Snow, Jr., Mrs. Louis Staudt, Dr. Augusta Webster, H. A. Wehmeier, James A. Wilhite, Charles C. Wooster, Mrs. Earl A. Zaus.

NATURALISTS' CALENDARS—THE FIRST ROOTS OF BIOLOGY

By KARL P. SCHMIDT
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

IT IS at the simplest observational level in natural history that one begins to keep a record of seasonal events—seasonable and unseasonable temperatures; winter visitants to one's bird shelf; the arrival of the first robin and then the stream of transient bird migrants; the blooming of the earliest flowers and of those that come after through the summer; the opening of the fishing season; the departure of birds in the fall; the entry of spermophile and woodchuck into their winter sleep; the gathering of his winter stores by the chipmunk; harvest and hunting season; and so again to the coming of winter. One records with equal interest the normal natural event and the exceptional one.



A FAMED NATURALIST'S CALENDAR
Woodcut frontispiece and title page of 1875 edition of Gilbert White's "The Natural History and Antiquities of Selborne." Original edition was published in 1789.

The earliest roots of scientific observation in prehistoric times may be discerned in the need for dating seedtime and harvest, which thus gives rise to the marking of the seasons by the annual march of the stars, with the development of calendars and of astronomy. In the intimate need of surviving severe weather by making use of good seasons, and hence the need of some knowledge of the weather's regularities, we have the origins of meteorology and climatology. In the knowledge, implicit in the crudest of agricultural civilization, of the mating time and breeding seasons of animals and of the times of flowering and the periods of growth of plants, we have the origin of much biology.

This very aspect of natural history continues to be much pursued, and when its facts are examined critically, it becomes the subscience of *phenology*, which the dictionary defines as the "science of the relations between climate and periodic biological phenomena, as the migrations and breeding of birds, the flowering and fruiting of plants, etc." The naturalist's calendar bears the same relation to phenology that natural history in general bears to the still new science of *ecology*.

CHILD'S PATH INTO SCIENCE

There is a natural recapitulation of the evolution of the race in our individual development from child to adult; and a parallel may be drawn between the mode of origin of early science and the way in which a child (or any amateur naturalist) may enter upon an interest in science. The simplest tool for the beginner, and one of the most important to any scientist, is a notebook. Any child who has enough tenacity to do so should be encouraged to keep his own notes of weather and of all that interests him in the world outside himself, for the writing down of observations will lead to more and better observation. It is only a short step from the gathering of facts to the discernment of the orderly and meaningful ways in which they arrange themselves, and this is already "science."

All this is by way of introduction to a brief commentary on the subject of those naturalists' calendars that have found their way into book form. It is a little paradoxical that naturalists, having been admonished from Agassiz' time to "study nature, not books," should be so prone to bookishness and to the collecting of books and that they should be such ready victims of the urge to write yet more books. Indeed, Louis Agassiz himself was the first bibliographer of natural history and a prodigious writer of books. If his famous dictum were to be taken literally, naturalists, at least, would not have read them.

Clearly, we need both observation in nature *and* books. It is the cycle from reading to original observation to yet more reading and then to renewed observation that produces the naturalist. The beginning, of course, may lie in *observation*, and the chain of interaction, with the writing of books and essays and technical papers as added links, may extend through a lifetime.

LITERARY STEPPINGSTONES

From the most cursory glance at book lists it appears that books with the title "Naturalist's Calendar" or "Naturalist's Almanac," under various literary permutations and combinations, are so numerous as to constitute a distinctive segment of popular natural-history writings. A naturalist's literary career has often begun with such a work, as seems to be the case with William Beebe (*A Log of the Sun*, 1906) and Donald Culross Peattie (*An Almanac for Moderns*, 1935). Contrariwise, an elder naturalist may gather his more fugitive essays under some such title toward the end of his career.

The kind of observation from which such books, and literary natural history in general, are derived is perhaps best exemplified by Gilbert White's *The Natural History and Antiquities of Selborne*, published in 1789. Gilbert White's only other work, published in 1795, after his death, is *A Naturalist's Calendar*. These works are so infused with love of nature and of the observation of nature for their own sake—are so objective in appearance, yet so clearly let the peaceful spirit of the old country curate shine in their pages—that they have had the qualities of popular and then of classic works in normal succession. There are almost as many editions of White's *Selborne* as there have been years since 1789. My own favorite is the Macmillan edition of 1875, with woodcut illustration and with *A Naturalist's Calendar* included. Gilbert White is to be regarded as the father of British natural history. It is the strength of the distinctively British school of eager observers in field and garden, at home and

(*Continued on page 4, column 3.*)

TEXAS FIND AUGMENTS MAMMALIAN HISTORY

On their way to attend the annual meeting of the Geological Society of America, held in El Paso during November, Dr. Rainer Zangerl, Curator of Fossil Reptiles, and Dr. Robert H. Denison, Curator of Fossil Fishes, made a brief stop in northern Texas. Their purpose was to examine an area that had been recommended by Glen L. Evans of the Texas Memorial Museum as a promising one for Early Cretaceous turtles. Noticing minute bone fragments on the surface of the ground, they made a close examination and almost at once Dr. Denison picked up a partial lower jaw of a mammal, a most exciting find that adds considerably to the history of mammals during the Age of Reptiles. Further search yielded hundreds of fragmentary remains of other vertebrates, among which were included those of dinosaurs, flying reptiles, lizards, frogs—the first thus far found in deposits of Cretaceous age—and fishes. On a return visit following the meetings, Dr. Denison found a second jaw, rather better preserved than the first. A brief summary of the early history of mammals will make the importance of this discovery clear.

The first record of mammals is contained in rocks of late Triassic age that were laid down about 180 million years ago. Very little is known about these earliest members of the class of animals to which we ourselves belong other than that they were diminutive and insignificant components of the fauna of that far-off time. Dinosaurs and other great reptilian groups had by that time entered their period of dominance that was to last for more than 100 million years longer. During this great stretch of time, which covered the Jurassic and Cretaceous Periods of earth history, the mammals remained small and inconspicuous. Not until after the extinction of the great reptiles, about 75 million years ago, did their turn for dominance arrive.

Despite the relatively unimportant role they appear to have played during the Age of Reptiles, mammals did achieve a considerable degree of evolutionary progress during this time. Glimpses from a few Jurassic localities reveal that at least four distinct groups were in existence by then, one of which may well have been broadly ancestral to all living mammals with the exception of the egg-laying monotremes of the Australian region. In late Cretaceous time, mammals were still small in size, but primitive representatives of the two major divisions of modern mammals—the placentals and the marsupials—were already in existence. Apart from a few isolated teeth found at a locality in southern England, mammalian history remained unknown from the end of the Jurrasic until near the end of the Cretaceous, a span of some 60 million years.

The great interest of the Texas discovery will now be apparent. It was made in Early Cretaceous deposits and therefore begins to close a great gap in our knowledge. The two specimens thus far found belong to an extinct group that was not ancestral to any living forms, but their finding holds forth the prospect that such ancestors may be found there in the future. Further work in the region is planned in co-operation with the Texas Memorial Museum and will be entered into with high hopes.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

"An important action of the Executive Committee has been the abandonment of all the industrial and historical collections of the Museum. With the exception of the annex occupied by transportation, the halls heretofore occupied by the industrial arts have been or soon will be transferred to the use of the Department of Anthropology, and the material heretofore contained therein returned to the donor, presented to appropriate institutions or stored away for further consideration. In this connection it is well to note the distribution of the material, photographs, paintings, etc., in Columbus Memorial Hall to the Chicago Historical Society, the University of Chicago, [and] the Newberry Library . . ."

George M. Pullman, a Museum Benefactor for whom Pullman Hall was named, died in 1900.

* * *

"The resignation of Mr. [J.] Dieserud, Librarian of the Museum, was accepted during the month of July, and Miss Elsie Lippincott was appointed as his successor.

"The most notable accession to the library was the splendid gift from Mr. Edward E. Ayer of his carefully selected Ornithological library, numbering approximately 400 volumes, many of them rare and all of the highest value. Special book cases were built for their installation, and also a special standing case for the set of Audubon."

The Hall of Plant Life (Martin A. and Carrie Ryerson Hall—Hall 29) presents a general view of the entire range of plant life from the lowest order, bacteria, as seen through a microscope, through the algae, fungi, mosses, and other flowerless plants, through the conifers, and flowering plants.

NATURALISTS' CALENDARS—

(*Continued from page 3*)

abroad, from which the great strength of the English and Scotch in the biological sciences is derived.

A glance at the Museum's library shelves reveals further exemplars of the naturalist's calendar. *A Year at the Shore* (1865) by Philip Henry Gosse, carries seaside observations through the year month by month. *Round the Year, A Series of Short Nature Sketches* (1896) is by the distinguished entomologist, L. C. Miall. *The Biology of the Seasons* (1911) is by J. Arthur Thomson, who wrote so voluminously on biological subjects that a work by him under some such title might have been predicted; he did, indeed, write a second book under this heading, *Nature All the Year Round* (1921). There is no likelihood of a dearth of volumes to represent the naturalist's calendar class of literary natural history. It is represented in 1949 by distinguished works—*The Twelve Seasons*, by Joseph Wood Krutch, and *A Sand Country Almanac*, by the late Aldo Leopold, whose poignantly tragic death while fighting a brush fire was somehow nobly fitting for a conservationist of such force and note. How appropriate it is that the current selection of the Natural History Book Club is a nature calendar from the Maine coast—Robert P. Tristram Coffin's *Coast Calendar*.

NEW CURATOR APPOINTED

George Langford has been appointed Curator of Fossil Plants effective January 1, it is announced by Colonel Clifford C. Gregg, Director. Mr. Langford joined the Museum staff in 1947 as Assistant in Fossil Plants. Before that he was engaged in industrial work as mechanical engineer with the Chicago Great Western Railroad for a brief period and with the McKenna Process Company from 1898 to 1945, inclusive. He invented and used new processes in metallurgy upon which seventy American and ten foreign patents have been issued in his name. He was a member of the class of 1897 of Yale University and obtained his mechanical engineering degree at the Sheffield Scientific School. Paleontology and paleobotany began as a hobby with Mr. Langford at the early age of twelve. In all the years in which he was engaged in industry, he was studying and collecting in this field on the side. After retiring from industry, he came to the Museum to make his hobby his principal occupation. He has also been interested in archaeology and is the author of several books and a number of articles in archaeological and other journals.

Civilizations of the ancient Near East from the middle of the fourth millennium B.C. to A.D. 400 are shown in Hall K.

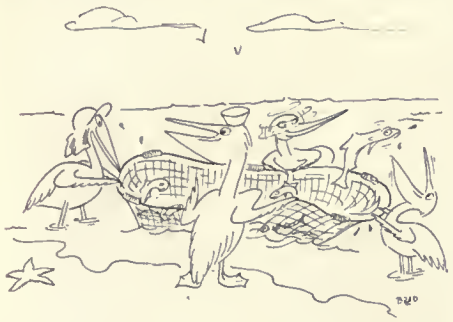
CO-OPERATION BY BIRDS

By AUSTIN L. RAND
CURATOR OF BIRDS

CO-OPERATION, according to my desk dictionary, is the working together of two or more individuals for a common object. The working together of two birds to rear a family is so well-known an affair that one forgets that it is an example of co-operation, not only in building the nest and brooding and feeding the young but also in defending nest and young.

Sometimes more than one species will join in ousting an enemy. For example, when a cat caught a young robin, recently out of the nest, the parents, in their frantic effort to make the cat release the bird, attracted the attention of another robin and a pair of cardinals nesting near-by in a honeysuckle. All five birds jumped on the cat's back, screaming and pecking it so vigorously that it released the young robin and returned to its home.

More spectacular are some of the co-operative activities of birds in food-getting. Bald eagles sometimes feed on ducks. Frequently two eagles may combine their efforts. The two birds may work together to force a black duck from the air onto the water, and when they are trying to catch a diving duck, they much more quickly exhaust their



prey by swooping at it in turn. Bald eagles sometimes take water birds too large for them to carry, and then they must flap along dragging their prey on the surface of the water to the nearest shore. On one occasion an eagle dragging a large cormorant ashore was joined by two other birds, and all three took turns in dragging it. When they got it ashore, all three shared it.

Several fish-eating birds co-operate in capturing their prey. "The merganser is primarily a fishing duck . . . very skillful and a voracious feeder. It pursues under water and catches successfully the swiftest fish. Often a party of sheldrakes may be seen fishing together, driving the panic-stricken fish into the shallows or into some small pool where they may be more easily caught."

When a school of fish approached a flock of white pelicans, the birds suddenly assumed a circular position, surrounding the school. All the pelicans moved slowly but cautiously toward the center of the circle, their heads near the surface of the water or partly submerged and their necks slightly extended. The birds moved in perfect unison, making the circle progressively smaller, ready to engulf their helpless victims at the first opportunity. When all the pelicans were close to the fish, the birds made rapid jabs at the fish and apparently consumed a large number of them. It appeared that every bird got from one to several fish.

13,000 BAND TOGETHER

Avocets and, to a lesser extent, the black-necked stilts also band together for co-operative drives on small fry and aquatic insects. Such drives are made in water of wading depth. Instead of forming circles, the birds present compact spearhead and wedge formations and sweep the bottom muck with the characteristic back-and-forth side movements of their long bills. As many as 13,000 avocets have been observed taking part in such co-operative feeding projects.

Another striking example is furnished by black vultures. A three-quarters-grown skunk was wandering across a field. "One vulture (after having been banded and liberated) alighted near the skunk which was then about two hundred feet from where I stood at my banding work. The skunk immediately stopped and raised its tail. Other vultures that were sitting around on the ground soon joined the one that was near to the skunk, and when six or eight of them had gathered about the animal one suddenly attacked it from the side. The skunk immediately discharged its musk, but this seemed to have no effect on the vultures, which, on its discharge, attacked in a mass.

"As soon as the attack was made, other vultures that were circling above the meadow or sitting in the trees near-by joined the group, until there were probably twenty-five or more around the skunk. They piled on to it, and with much flapping and croaking, pulled it about until it was dead, then devoured it." (McIllhenny.)

On another occasion a black vulture came from high in the air to alight near two full-grown opossums "that were following a narrow cattle trail which led from the cypress swamp at the foot of the hills across a wide piece of open land to the timber on the hills. The first vulture was almost at once joined by many others that dropped down from the sky with almost unbelievable swiftness, until there were probably between seventy-five and one hundred black vultures following the opossums, some on both sides, some in the rear. Suddenly, three or four of the vultures attacked one opossum at the same time." Quickly, "both opossums were covered with a swarm of hissing, flapping birds, and within fifteen minutes there was nothing left of them but the larger bones and the hides, and these were stripped of every vestige of flesh." (McIllhenny.)

EIGHTEEN EXPEDITIONS FOR MUSEUM IN 1950

A program calling for fourteen new expeditions, in addition to the continuation of four already in the field, has been announced by Colonel Clifford C. Gregg, Director.

The fourteen new expeditions are as follows:

Florida Keys Fish Collecting Trip (January)—Loren P. Woods, Curator of Fishes.

Appalachian and Ouachita Mountains Zoological Field Trip (March)—Clifford H. Pope, Curator of Amphibians and Reptiles.

Field Work for Cave Fishes (March)—Loren P. Woods, Curator of Fishes.

British North Borneo Zoological Expedition (April)—D. Dwight Davis, Curator of Vertebrate Anatomy, and Robert F. Inger, Assistant Curator of Fishes.

Texas Zoological Field Trip (April)—Karl P. Schmidt, Chief Curator of Zoology.

Wilmington (Illinois) Paleobotanical Trips (April)—George Langford, Curator of Fossil Plants.

Texas Paleontological Expedition (April, May, and June)—Bryan Patterson, Curator of Fossil Mammals, and Dr. Rainer Zangerl, Curator of Fossil Reptiles.

Mississippi Valley Field Trip (May)—Robert Kriss Wyant, Curator of Economic Geology.

Sixteenth Southwest Archaeological Expedition (June)—Dr. Paul S. Martin, Chief Curator of Anthropology, leader.

Bermuda Zoological Expedition (June, July, and August)—Dr. Fritz Haas, Curator of Lower Invertebrates, and Joseph B. Krstolich, Artist.

Utah Paleontological Expedition (June and July)—Dr. Robert H. Denison, Curator of Fossil Fishes.

Florida Zoological Field Trip (June)—Leon L. Walters, Taxidermist, and Ronald J. Lambert, Assistant Taxidermist.

Canadian Invertebrate Paleontological Expedition (July and August)—Eugene S. Richardson, Jr., Curator of Fossil Invertebrates.

Arkansas Zoological Field Trip (September)—Colin Campbell Sanborn, Curator of Mammals, and Kenneth Woehlck, Assistant Taxidermist.

ALREADY IN FIELD

The four expeditions continuing activities begun in 1949 or earlier are:

Micronesian Anthropological Expedition (1949–50)—Dr. Alexander Spoehr, Curator of Oceanic Ethnology.

Middle Central American Botanical Expedition (1948–49–50)—Paul C. Standley, Curator of the Herbarium.

Colombian Zoological Expedition (1948–49–50)—Philip Hershkovitz, Assistant Curator of Mammals.

United States Naval Medical Research Unit No. 3, Cairo, Egypt (1949–50)—Harry Hoogstraal, Field Associate.

RUSH WATKINS COLLECTION FROM SIAM RECEIVED

The collections made by the Rush Watkins Zoological Expedition to Siam arrived recently at the Museum after more than two months in transit from Bangkok.

Among the specimens are two Malay tapirs to be used in a habitat group in the Hall of Asiatic Mammals (Hall 17). Besides the tapirs there are skins and horns of the fast-disappearing Eld's deer and a series of five species of squirrels including the giant squirrel, which is about four feet in length. Many bats were collected, and some extremely rare and interesting parasites were found on them.

Nearly 1,000 specimens of fishes were brought home. One species was found with sharp curved bones hidden in a socket under each eye that can be extruded at will as an extraordinarily effective means of defense. The collection of shells represents most of the fresh-water species known from Siam, and most of the marine forms are new to the Museum series. Some birds, reptiles, and amphibians were also included.

The expedition members were A. Rush Watkins, sponsor, Colin Campbell Sanborn, Curator of Mammals, and Frank C. Wonder, Preparator. Time in the field amounted to eight weeks in the west-central and later in the southern part of the country.

CAMP OF THE RUSH WATKINS EXPEDITION IN SIAM

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

THE AWAKENING VALLEY. By John Collier, Jr., and Anibal Buitron. University of Chicago Press, October, 1949. 199 pages, 167 illustrations. Price $6.

Most ethnological reports make dull reading for the layman, because such reports are written for the specialist.

Here, however, in *The Awakening Valley*, one finds a rare if not unique type of ethnological report—one that makes immediate appeal to any reader because of the subtle and rich blending of text and photographs. The text is simply written—a fact that implies great skill, feeling, and insight. The illustrations express an artistry that is breath-taking and an imagination that illuminates the entire book. The photographs alone tell the story; and yet the text is complete also. Each is a beautiful entity and yet the two, like the themes of a fugue, are so interwoven that they cannot be separated.

The artist, Collier, and the social scientist, Buitron, tell the story of a small settlement of Ecuadorian Indians and their near-by town Otavalo. By means of sections that deal with such subjects as agriculture, civil affairs, marriage, baptism, death, and the changing economy this story is told so skillfully by words and photographs that the reader feels he is indeed in Ecuador and is sharing the life of these Indians.

But aside from these techniques, the great event that makes the story worth telling is the miraculous and recent economic improvement that the Indians have achieved by their own efforts. Indians in many places in the New World live in poverty that belies description—not so much poverty of tangibles as of the spirit, a poverty that robs them of independence, initiative, purposefulness, self-reliance. When a man has these things—be he red, white, or black—he walks as a free man, not as a slave.

By chance, a textile industry has come into being in the Valley during the last generation—at first small and weak, now lusty and growing. The tweeds woven by the Indians there are now sought after wide and far. The money thus acquired is used for buying back from the hacienda owners the land that was once Indian property. The events that follow in the train of successful business, the absorption of the good in white civilization and the rejection of that which is not needful, and the development of energy and faith—an almost complete rebirth—these are the things that make the story of *The Awakening Valley* vital and exciting.

Here, for once, the ethnologist has a chance to observe and describe a resurgence instead of a decline, or worse, a degeneration.

PAUL S. MARTIN
Chief Curator, Department of Anthropology

Technical Publications Issued

Fieldiana: Anthropology, Vol. 39. *Majuro, A Village in the Marshall Islands.* By Alexander Spoehr. November 17, 1949. 266 pages, 50 text figures, 11 maps. $3.50.

The Museum Press has recently issued a publication entitled *Majuro, A Village in the Marshall Islands*, by Dr. Alexander Spoehr, Curator of Oceanic Ethnology. This 266-page report contains the results of Dr. Spoehr's investigations on Majuro Atoll during the Ethnological Expedition to Micronesia, 1947, which was carried out in co-operation with the Pacific Science Board and the United States Navy. It is a study of the social organization of these people and the changes in their way of life resulting from the American administration of Micronesia, from the events of the last war, and from previous contacts with European and Asiatic cultures. The report is generously illustrated with photographs, drawings, maps, and charts.

Plant life of the sea may, in numbers of kinds and individuals, exceed the vegetation found on land. Some of the outstanding seaweeds are shown, as they grow in life, in the North Atlantic coast habitat group installed in Martin A. and Carrie Ryerson Hall (Plant Life, Hall 29).

The proximity of Roosevelt College to the Museum has occasioned the frequent use of Museum exhibits by its students.

DESPISED WEEDS SOMETIMES PROVE BENEFACTORS OF MAN

By HUGH C. CUTLER
CURATOR OF ECONOMIC BOTANY

A WEED, the dictionary says, is any useless or troublesome plant. But, like humans, plants are never entirely bad or good and some plants we call weeds are really friends and helpers. The Russian thistle, or tumbleweed, is one of these.

It came to the United States from Europe more than fifty years ago and slowly spread through the dry West. The Russian thistle made little progress on good soils where it had to compete with native prairie vegetation or with cultivated grain crops, but on poor soils, where other plants struggled, the immigrant flourished.

About the time of World War I the Russian thistle began to spread more rapidly, especially along the ditches of new roads. Many agriculturists spoke angrily about the advancing weed, as few of them realized the tumbleweed was helping to control erosion on the banks of our expanding highway system.

Soon afterwards, when a series of dry years shriveled up the fields of grain and weakened even native plants, only a few weeds, among them the Russian thistle, were left on farms to keep the soil in place.

RURAL SCENE IN KANSAS
Russian thistles in lower left foreground.

In some places even the Russian thistle was blown out. The plants tumbled over the fields and piled up along the fences, a last line of resistance to the dust storms.

When the first explorers penetrated the Navajo country, many canyons were thickly covered with green plants, and small streams of clear water ran throughout the year. Then the Navajos acquired sheep and before long the flocks had multiplied so that most of the accessible forage was destroyed. With the protective plant-cover gone, rains washed away the good topsoil and cut the stream beds until they were deep gullies, always dry except for the short-lived floods that followed a rain.

The Russian thistle began to spread over the poor soils and before long there was enough of it to protect more desirable plants. When dead, the old plants rolled over the plains, scattering their seeds, and fell into the gullies. Here they slowed down the flow of the silt-laden floodwaters. Erosion-control dams and reduction in the numbers of livestock allowed on the land have helped to restore the Navajo country, but the Russian thistle is responsible for much of the improvement.

EVEN RAGWEED IS USEFUL

But the Russian thistle is not the only plant that saves man from his follies. In the Chicago area we are familiar with ragweed covering land that has been disturbed by construction work. To the ever-growing number of hay-fever sufferers the plant is troublesome when in flower, but it is covering the ground and helping to hold it in place. Where the land is left for a long time, other plants eventually replace the ragweed.

On many of the ranches of our West, sagebrush (an entire plant of this is on exhibition in the center of Hall 26) is the most common plant now because cattle have eaten all the grass. Without competition from the grasses, the less palatable sagebrush flourished. Many ranchers who attempted to keep more cattle than the land could carry would have been left with only bare rocks and gullies if the sagebrush had not held the soil once the grass was gone.

Some other plants, like creosote bush, blackbrush, rabbit brush, and saltbrush, function in the same way. Ranchers are now trying to eliminate these plants by cutting and burning and by using weed-killers like 2,4-D. These expedients are necessary whenever grasses are so weakened by continued grazing that they cannot compete successfully with the less desirable shrubs.

Thus, as weeds are often useful, useful plants are often weeds. The scattered corn plants in fields of soybeans are examples of this. Soybeans are usually planted the year after corn and some of the corn dropped at harvest time grows up the following year. These plants shade and compete with the soybeans and interfere with the harvest operations. The stalks seldom bear usable ears, and even if they did, it would not be worth while to collect them.

Exploring Florida Waters

Loren P. Woods, Curator of Fishes, left last month on a field trip to southern Florida. He is seeking species of fishes to fill gaps in the Museum collection.

Coming. February 1–28, Fifth Chicago International Nature Photography Exhibition.

JANUARY LECTURE TOURS DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Jan 4—Circus Animals and Their Homes (*Jane Sharpe*).

Fri., Jan. 6—Your Winter Vacation—The Andes Countries. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., Jan. 11—Chinese Fundamentals—Ancient Foundations of the Chinese Way of Life (*Harriet Smith*).

Fri., Jan. 13—From Polar Bears to Penguins. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Jan 18—The Primitive Traveler (*June Buchwald*).

Fri., Jan. 20—Adventures of a Fossil Hunter. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Jan. 25—Natural Storage of Food—Seeds, Roots, and Other Plant Parts (*Miriam Wood*).

Fri., Jan. 27—Building Blocks of the Universe—Atoms and Elements. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Persons wishing to participate should apply at North Entrance. Tours are free.

STAFF NOTES

D. Dwight Davis, Curator of Vertebrate Anatomy, has concluded the special laboratory course on "Comparative Anatomy of the Head" that he gave for students in the graduate school at the University of Chicago. The course was under the direction of **Dr. Everett C. Olson** of the university faculty (Museum Research Associate in Fossil Vertebrates). **Dr. Rainer Zangerl**, Curator of Fossil Reptiles, and other members of the Museum staff contributed advice and assistance .... **Donald Collier**, Curator of South American Ethnology and Archaeology, has been appointed book-review editor of the *American Anthropologist*, official organ of the American Anthropological Association .... **Dr. Paul S. Martin**, Chief Curator of Anthropology, and **George I. Quimby**, Curator of Exhibits, recently were interviewed on a radio program for station WMBI, the topic being the exhibits in the new Hall of Indian America .... **Dr. Jose Cuatrecasas**, Curator of Colombian Botany, spoke to the Ecology Group (students and faculty at the University of Chicago, Department of Zoology) on "Mangroves of the Pacific Coast of South America."... **Dr. Theodor Just**, Chief Curator of Botany, gave two botanical seminar talks at the University of Illinois, Urbana, on "Work of the Department of Botany, Chicago Natural History Museum," and "Rates of Evolutionary Processes."... **Dr. Hugh C. Cutler**, Curator of Economic Botany, visited Cornell University in December for some special plant studies in the Bailey Hortorium .... Dr. Cutler, **Dr. Julian A. Steyermark**, Associate Curator of the Herbarium, and Dr. Cuatrecasas attended the New York meetings in December of the American Association for the Advancement of Science and participated in the symposium on the plant geography of South America .... **Marie Svoboda**, Raymond Foundation lecturer, represented the Museum in a panel discussion on "How can science be made an integral part of the elementary school school program?" at a Chicago conference of the Central Association for Science and Mathematics Teachers. Miss Svoboda described and demonstrated with materials how this Museum helps make science a part of the school curriculum.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: A. W. Bahr, Westmount, Que., Canada—a stone head of a Buddhistic deity of the Tang dynasty (621–907), China.

Department of Botany:

From: Donald Richards, Chicago—158 specimens of algae, New Brunswick; Elmer J. Richards, Chicago—2,011 specimens of algae; Dr. Richard Evans Schultes, Cambridge, Mass.—107 herbarium specimens, Brazil and Colombia; William Culberson, Cincinnati—52 specimens of fungi, Cincinnati region; Dr. Maxwell S. Doty, Evanston, Ill.—79 hepatics, Oregon and California; Dr. William Randolph Taylor, Ann Arbor, Mich.—56 specimens of algae, Bermuda.

Department of Geology:

From: William M. Murray, Chicago—a physical geology specimen showing differential weathering, Glacier Park; Stuart H. Perry, Adrian, Mich.—Gergenti meteorite specimen (incomplete individual, with crust, 2,151 grams), Sicily; Dr. and Mrs. R. H. Whitfield and Jon S. Whitfield, Evanston, Ill.—319 fossil plant specimens.

Department of Zoology:

From: Harry Hoogstraal, Chicago—28 robber flies, including one allotype and two holotypes, Mexico; Leslie Hubricht, Danville, Va.—14 salamanders, southeastern U.S.; Maj. Robert Traub, Washington, D.C.—29 mammal skins and skulls, Malaya; Chicago Zoological Society, Brookfield, Ill.—2 lizards, Australia; Frank H. Seaton, Tampa, Fla.—a snake, Florida; Maj. Howard T. Wright, Orlando, Fla.—445 insects and allies, and 18 isopods, southeastern Asia and the Philippine Islands; Henry S. Dybas, Hazelcrest, Ill.—1,177 insects, U.S., Mexico, and Colombia; Lillian A. Ross, Chicago—159 insects and allies, U.S. and Virgin Islands; Col. Clifford C. Gregg, Valparaiso, Ind.—2 millipedes, 2 spiders, a phalangid, and 10 ants, Indiana; Clair Cotterill, Chicago—48 insects, Maine; American Museum of Natural History, New York—a parrot fish and 75 pomacentrid fishes, British West Indies; Richard Archbold, Lake Placid, Fla.—a lizard, Florida; Dr. Alvin R. Cahn, U.S. Army—a salamander, Honshu Island, Japan; Col. E. W. Wentworth, Chicago—5 skulls of selected purebred hogs, with pedigrees; Lieut. John F. Kurfess, U.S. Navy—15 lizards and 9 snakes, Guam.

Library:

From: Art Institute of Chicago; Col. Clifford C. Gregg, Valparaiso, Ind.; Dr. Henry Field, Washington, D.C.; Anthony Mazur, Chicago; and Eugene S. Richardson, Jr., Winnetka, Ill.

4-H BOYS AND GIRLS LAUD MUSEUM

During the period of the International Live Stock Exposition in Chicago, which closed early last month, the Museum entertained, as usual, the delegates to the National Congress of 4-H Clubs, totaling some 1,235 American boys and girls. As usual, these splendid young people from the rural areas of the United States were enthusiastic in their praise not only of the Museum but of almost everyone and everything in Chicago. This visit marked for many of them their first stay in a large city.

Of special interest perhaps is the opening sentence in a letter of thanks received from a young lady in Texas shortly after her return home: "A building so large and exhibits so grand I have never seen—even in Texas!"

Another letter commented: "You cannot imagine what a world of wonders the Museum opened up to me—a junior in a little high school in a small prairie town. I wish I could spend a month looking at the exhibits for I am terribly interested. Someday, I would like to be in an expedition to find things."

Audubon Lecture Jan. 7

The Illinois Audubon Society will present the third lecture in its current series on Saturday, January 7, at 2:30 P.M. in the James Simpson Theatre of the Museum. George and Arlene Hadley, leaders in Detroit's out-of-doors movement, will present the story of their activities under the title "Happy Valley." The lecture will be accompanied by a color motion-picture film recording canoe treks through northern Michigan—the land of Hiawatha. The Hadleys will tell of the poetry and philosophy they found in trees, wild flowers, songbirds, and wild animals of the woods.

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Chicago Natural History Museum

5th Chicago International Nature Photo Exhibit
February 1-28

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

ATTENDANCE UP IN 1949

The number of visitors received at the Museum during 1949 was 1,145,359. This is a slight increase over the preceding year, when attendance was 1,134,643. Of the 1949 attendance, 1,022,580 were free admissions—children, students, teachers, Museum Members, and others admitted free on all days, in addition to the general public on free days. Only 122,779 visitors paid the nominal fee charged on Mondays, Tuesdays, Wednesdays, and Fridays. This compares with a paid attendance of 128,845 in 1948.

Museum Officers Re-elected

Stanley Field has begun his 42nd consecutive year as President of Chicago Natural History Museum, having been re-elected at the Annual Meeting of the Board of Trustees held January 16. Other officers re-elected are: Marshall Field, First Vice-President; Albert B. Dick, Jr., Second Vice-President; Samuel Insull, Jr., Third Vice-President; Solomon A. Smith, Treasurer; Colonel Clifford C. Gregg, Director and Secretary; and John R. Millar, Assistant Secretary.

Museum Contributor Elected

Henry S. Dybas, Assistant Curator of Insects, has been elected a Museum Contributor in recognition of his gifts of natural-history specimens and books to the Museum. The designation "Contributor" includes all those who give to the Museum from $1,000 to $100,000 in money or materials.

WINNER OF SCIENCE QUIZ WELCOMED AT MUSEUM

Director Gregg meets Boston champion

The accompanying photograph shows Colonel Clifford C. Gregg, Director of Chicago Natural History Museum, greeting Miss Antoinette Cutrona, 13 years old, who won a contest, "Science is Fun," sponsored by the Boston Museum of Science and the *Boston Post*. The prize was a visit to Chicago by airliner for the winning girl and her mother, who is in the picture. Also accompanying Miss Cutrona were Miss Caroline Harrison, public relations representative of the Boston Museum of Science, and a reporter for the *Boston Post*. Participation in the contest, a series of fourteen quizzes, was limited to young people from eight to fourteen years of age. Miss Cutrona spent several days in Chicago, where she visited various museums, zoos, and other institutions.

Audubon Lecture Feb. 18

The fourth lecture in the current series of the Illinois Audubon Society will be given Saturday, February 18, at 2:30 P.M., in the James Simpson Theatre of the Museum. The lecture is "Bird Magic in Mexico," by George Miksch Sutton, of Ann Arbor, Michigan. Dr. Sutton, scientist, artist, and distinguished ornithologist, was co-leader of an expedition to the tropical wilderness of Tamaulipas, Mexico. In motion pictures, "Bird Magic in Mexico" portrays the brilliant jungle life, with its unusual and gaily colored birds, insects, and flowering plants, many of them now recorded in film for the first time.

THIS MONTH'S COVER

"Wild Geese at Sunrise" is the title of the cover picture. It is a photograph by Charles J. Cignatta, of Baltimore, who has entered it in the Fifth Chicago International Nature Photography Exhibition to be held at the Museum February 1–28. The exhibition is sponsored jointly by the Museum and the Nature Camera Club of Chicago.

NOTED FRENCH EXPERT VISITS MUSEUM

Georges Henri Rivière, Associate General Director of the International Council of Museums, was a visitor at Chicago Natural History Museum on January 5. M. Rivière had recently come from Haiti, where he spent seven weeks advising the Haitian government on the setting up of a projected "folk museum" in Port-au-Prince. In the United States he has been making a study of principal museums in New York, Washington, Chicago, and elsewhere. M. Rivière will return to Paris shortly to prepare for the opening of the new Museum of French Ethnology and Folk Art, of which he is curator. He is also an associate editor of *Museums*, a publication of UNESCO.

M. Rivière conferred at this Museum with Colonel Clifford C. Gregg, Director, Dr. Paul S. Martin, Chief Curator of Anthropology, and Dr. Sharat K. Roy, Chief Curator of Geology. He was especially impressed with the new Hall of Indian America (Hall 4), which he pronounced the finest exhibit of its type that he has seen anywhere.

NEW MEMBERS

The following persons became Museum Members between December 16 and January 13:

Associate Members

Mrs. Joseph M. Cudahy, Adolph Ettlinger, William H. Lerch, Mrs. Frank E. Nagel.

Annual Members

George Albiez, John G. American, John Brugaletta, Edward M. Cummings, John H. Goessele, Carl L. Goetz, Dr. R. Wendell Harrison, Mrs. James E. Hastings, George J. Leahy, John M. McDonald, Eugene V. Morrissy, Joseph H. Oberfelder, Andrew P. Olsen, Dr. Angelo R. Patti, Ralph E. Patton, David Priest, Mrs. Jack Pritzker, John P. Purdy, Miss Marie Katherine Remien, Fred C. Rowley, Jr., Leonard P. Spacek, Melvin Thillens, Dr. Albert G. Waldman, Harold Wellin, George B. Whitfield, R. P. Wolchina.

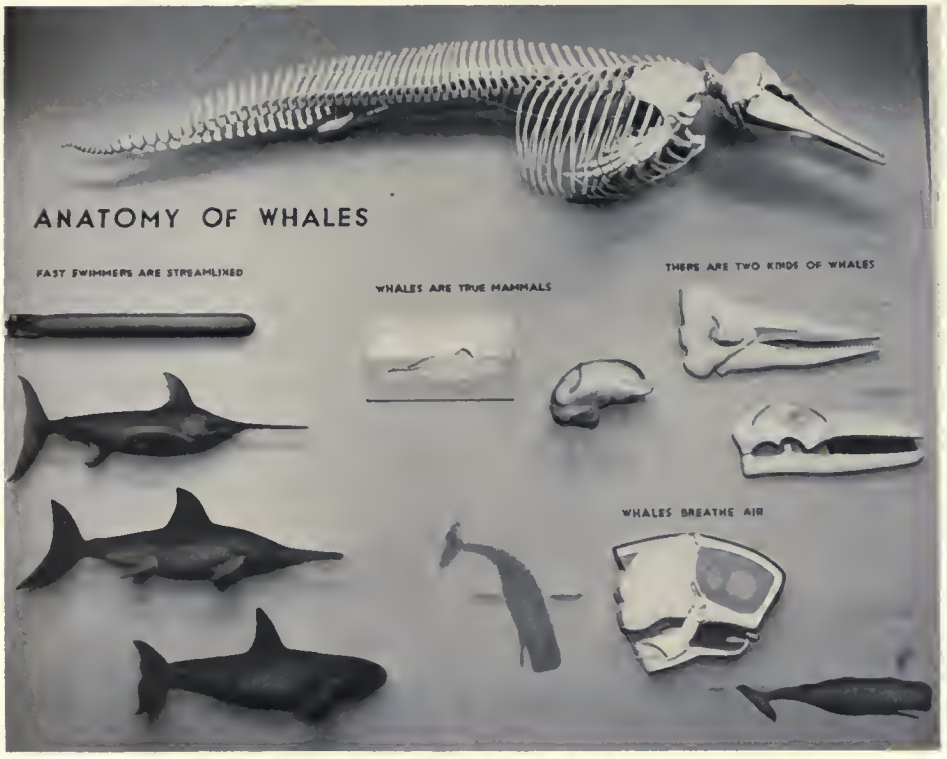
Mark your calendar: Saturday afternoons in March and April, free illustrated lectures on science and travel at the Museum.

WHALES, MOST REMARKABLE MAMMALS THAT EVER LIVED

By D. DWIGHT DAVIS
CURATOR OF VERTEBRATE ANATOMY

Whales are the most gigantic animals that ever lived on earth. A blue whale 100 feet long and weighing 150 tons is larger than the largest of the dinosaurs. Beside it a ten-ton elephant is a pigmy.

Partly because of their tremendous size, partly too because of the difficulties of observing them, and, finally, because man has long engaged in hunting them, whales have always attracted interest. In the vast expanse of the ocean even a whale is a tiny object, poorly seen because, like an iceberg, most of its bulk is hidden beneath the surface. Even today a beached whale causes a flurry of local excitement and is likely to be pictured in newspapers throughout the country.


ANATOMY OF WHALES
FAST SWIMMERS ARE STREAMLINED
WHALES ARE TRUE MAMMALS
THERE ARE TWO KINDS OF WHALES
WHALES BREATHE AIR

WHALE 'STREAMLINING' ILLUSTRATED IN NEW EXHIBIT

A model of a torpedo on the left shows how man has adopted nature's methods to decrease water resistance to a minimum.

The "beaching" of a whale is the key to the whole story. The largest whales can be as big as they are only because their enormous bulk is supported by water. A creature of such proportions would be helpless on land; the muscles required to move such weight would themselves be so great that the monster would have to be even larger, requiring still greater bones and muscles, and so on ad infinitum. Engineers have a simple formula to prove that it can't be done.

Whales are mammals, no matter how fishy they may look. Other mammals—seals, otters, or beavers, for example—spend a good deal of time in the water, but none is so completely tied to an aquatic life as are the whales. Only the manatees and dugongs approach the whales in their dependence on water, but they never venture beyond the shallow coastal waters and are less specialized.

Adapting a hairy, four-footed, air-breathing mammal to a perpetual life on the high seas was something of an evolutionary problem, and the astonishing contrivances by which this was accomplished have excited the wonder of biologists from earliest times. Whales are the most highly modified of all known mammals, living or extinct.

Merely cataloguing some of the problems whales had to solve gives an idea of the adjustments that were required in their evolution. They are warm-blooded like other mammals. But water conducts heat 27 times as rapidly as air, and the thick layer of fatty blubber is the whales' answer to this insulation problem. Water is 227 times as dense as air, and an animal moving through water even at the relatively slow speed of a whale must be as well streamlined as the fastest jet plane. For the same reason, a man-made torpedo is well streamlined, although it travels through the water at a top speed of only 30 to 40 miles per hour. The hind legs are missing in all whales, but hip bones remain as a functionless vestige.

Like other mammals, whales nourish their young with milk. To do this successfully they have developed a remarkable system of injecting milk into the mouth of the young. Even special physiological adjustments to drinking salt water were necessary in an animal that never comes into contact with fresh water.

Of course a whale has no gills and would drown promptly if deprived of air. The devices for insuring a constant supply of air—and for insuring that water cannot get into the lungs—are remarkable. In all whales there is only one nostril. Instead of being on the tip of the snout, where water could enter as the whale lies on the water surface, it opens on top of the head, as the so-called "blowhole." The larynx, or "voice box," is thrust directly into the back of the nose, so that it is impossible for a whale to get food or water into its "Sunday throat."

A series of models explaining some of these remarkable modifications was recently installed in the Whale Hall (Hall N-1). The models were prepared by Artist-Preparator Joseph B. Krstolich under the direction of the author. A companion exhibit covering the biology of whales is in preparation.

BLUE MUSHROOMS

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

Sometimes the experiences that befall a botanist are amusing as well as interesting and scientifically profitable. For instance, during the summer of 1949, while on a collecting trip in the southern part of Missouri, I was botanizing the slopes of a deep canyon known as Grand Gulch, when I spotted a dark blue object on the ground and discovered to my surprise that it was a mushroom.

Back in Chicago, I immediately turned the specimen over to Dr. Francis Drouet, Curator of the Cryptogamic Herbarium, with the request that he try to name it for me, assuring him that I had never observed a mushroom of such unusual color. He at once recognized it as a mushroom known botanically as *Lactarius indigo*, and showed me an illustration of it.

ONE FROM GUATEMALA

Then Dr. Drouet showed me to my great surprise and bewilderment the only specimen of this species in our herbarium, which I had collected in 1942 in Guatemala, Central America, on the volcano of Santa Clara. The label of this Guatemalan collection showed that I had recorded the bluish color of this specimen realizing its unusual character.

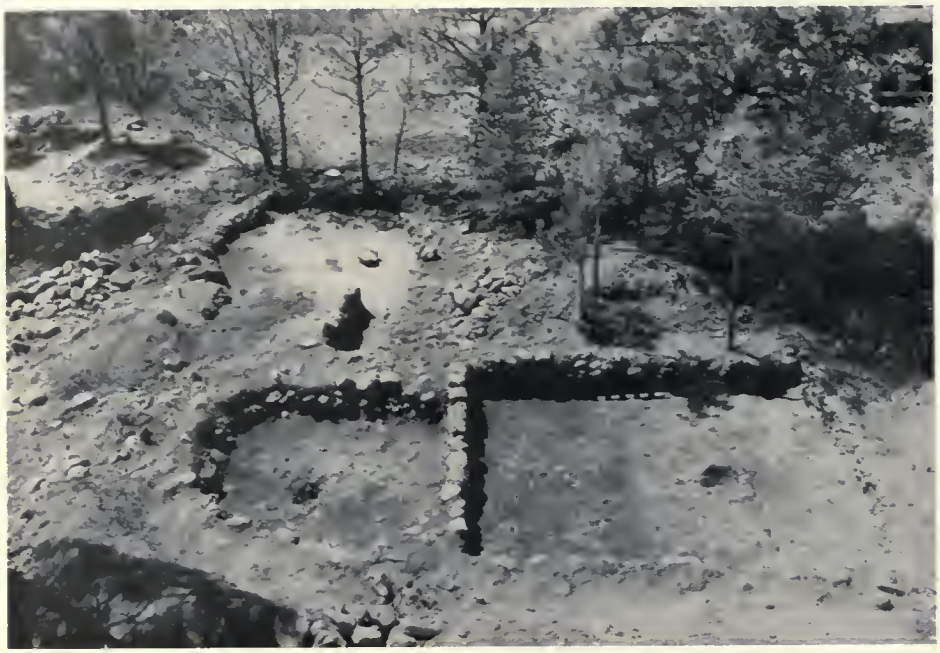
This brought up the question of how common blue is as a color in mushrooms and other fungi. Talking with Dr. Drouet

(*Continued on page 7, column 3*)

RESURRECTING A PREHISTORIC INDIAN VILLAGE

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

WE MADE some startling archaeological discoveries—Rinaldo* and I—during the summer of 1949 in remote Pine Lawn Valley in the Apache National Forest of western New Mexico, where we were conducting the 15th Archaeological Expedition to the Southwest of Chicago Natural History Museum. We are studying there a culture called Mogollon, which differs greatly from the better-known Pueblo "cliff house" culture.



NEW MEXICO HOUSING DEVELOPMENT, A.D. 1000

An example of earliest surface house with stone masonry walls—South Leggett Pueblo, excavated by the Museum's Archaeological Expedition to the Southwest.

Our objectives in the 1949 season were to hunt for the houses in which Early Man lived (by "early" we mean about 4,500 years ago) and to find and to excavate some ruins that, on the basis of superficial studies, might date at about A.D. 1000.

In previous seasons we had excavated ruins that are dated by estimate at A.D. 500, 600, 700, and 900, respectively. These ruins consisted entirely of separate pit houses scattered here and there in the forest. A pit house is a kind of cellar-house, with the floor three or four feet below ground level and a roof made of logs and dirt.

UP OUT OF THE CELLAR

But the excavations of 1949 brought forth information of quite a different character. The houses built by the Indians of about A.D. 1000 were completely unlike those of the preceding eras. These houses were built on top of the ground, with masonry walls. And, because it was made up of many contiguous rooms, each house was really a hamlet or small town. Such a village-house probably resembled a one-story apartment house and was occupied by several families.

What architectural innovations! Here we have for the first time in that area (1) stone walls or masonry, (2) rooms on top of the ground, (3) contiguous rooms, and (4) a special type of doorway. And, in addition, new and better tools and different kinds of pottery were found. Where all these new ideas came from is not certain, but we do feel sure they were borrowed and not invented on the spot.

Now, if you were to look at the crude and disintegrated walls we uncovered, you would certainly wonder what all this shouting is about.

Let me explain.

Let us turn the magic lens of the archaeologist on these ruins and then see what we can see.

OPENS SOCIOLOGICAL VISTAS

First off, by studying the architecture of these "villages," we find that there is more to the problem than just stones, mortar, and method of construction. The study of these early surface houses provides us with extensive knowledge of the way these Indians lived. We find that much is revealed about the customs, the era, and the profound changes in social patterns.

"How can that be?" you may ask.

The answer is that the ruins that we excavated and studied constitute a kind of book, which, with the proper "key," can be read. By reading, I mean that we can make inferences. But we are careful to shield our inferences from the stigma of "science fiction" that one reads in some newspaper supplements or pulp magazines.

Let me give an example of the kind of inference we may safely make. If we find bone needles in our excavations, we may infer that sewing was done, that perhaps skins were sewed together for various uses, including possibly clothing. If we find a small ash-filled hole in the floor of a house, we may assume that fire was known and that it may have been used for lighting or cooking or both. This is what I mean by "reading" the "book" or making inferences from the data obtained by excavations.

Now, under the "magic lens" what do our crude masonry walls and our ruined village-house become? What can we see?

ERA OF ISOLATION ENDS

First, we can see that the centuries-long isolation of the Mogollon Indians has been breached. Isolation, caused by dwelling in sheltered mountain villages, had retarded the cultural development of these people. They were outside the main stream of history. But now, for reasons yet unknown to us, new influences washed over the Mogollon Indians and profoundly changed them.

Instead of living in small one-family houses scattered here and there in the forest, they began to live together in one-story apartment surface houses with walls of stone. These conglomerations of rooms in effect constituted compact small villages, and such village life entailed changes in the social organization of the Mogollon Indians.

One of these changes would be the need for some governmental mechanism, such as a chief or a council or both. No longer could each man go his own way; others' feelings and wishes would have to be considered. Forms of social control would be needed with which to co-ordinate effort and reduce friction in this larger and more compact community. Habits of co-operation would develop. Building a multi-roomed unit to house five or ten families would require the pooling of skills and of efforts. Farming would probably be done communally. This might produce a greater food supply, and this in turn would create more stability and a somewhat greater density of population. A greater population would increase the chances of producing more inventors.

Because all the time of all the population would now not be needed to fill bellies, more leisure would be created and some energies could be devoted to the development of specialists—such as potters, weavers, basket-makers, architects, artisans and artists, priests, shamans, and politicians. Thus all

* Dr. John B. Rinaldo, Assistant in Archaeology.

patterns of conduct were probably modified —slowly but surely. Although these small towns were distinctly rural, yet the people had started along the rocky and arduous road toward urbanism, specialization, different roles (ruler and ruled, priests, etc.), and co-ordination of human efforts.

DAWN OF A CIVILIZATION

Thus, in these humble ruins, one can observe the very first stumbling steps that man took on his way toward civilization. These excavations, then, take on tremendous significance, for here we can observe in miniature the same processes of development through which our own ancestors went about 3,000 or 4,000 years ago.

The inferences seem conservative and logical in that they follow the general patterns of human conduct and breathe life into the rooms from which we cleared the debris of centuries. These inferences—resulting from the painstaking sifting of evidence, measuring, and mapping—make our summer's work worth while. We are not interested in details per se but for what information we can squeeze out of them. We found the "bones" of a village and, in a manner of speaking, we have articulated them and clothed them with flesh and blood, so that once more these villages are occupied and throb with human activities.

FEBRUARY LECTURE TOURS DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Feb. 1—Animals of Illinois (*Jane Sharpe*).

Fri., Feb. 3—Unusual Pets. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., Feb. 8—Exotic and Unusual Flowers (*Marie Svoboda*).

Fri., Feb. 10—Trees in Winter. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., Feb. 15—Animals of the Orient (*Lorain Farmer*).

Fri., Feb. 17—Your Trip to Florida—Indians, Animals, and Plants. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Feb. 22—Watermarks—The Work of Surface and Subsurface Water (*Anne Stromquist*).

Fri., Feb. 24—Getting Along with Winter—How People and Animals Adjust to the Cold. Illustrated introduction in Meeting Room (*Harriet Smith*).

SCHOOL TEACHERS LEARN HOW TO USE THE MUSEUM

By MIRIAM WOOD
CHIEF, RAYMOND FOUNDATION

Did you ever stop to watch a teacher or Museum guide take a group of school children through the Museum halls? Many visitors are seen watching this never-ending and always-different drama in the Museum. They often interrupt their own browsing to watch in astonishment. Sometimes they smile, possibly as they think of their own school days. A few of these visitors get so interested in the school children that they follow along with them to listen to their comments and questions and to hear the answers and explanations given by the teacher or guide as the story of the natural history of the world unfolds in exhibit after exhibit.

SCHOOL CHILDREN STUDYING MASTODON SKELETON

Eventually the visitor begins to comment and ask questions: "How wonderful that children today can learn so easily by seeing!" and "How did that teacher learn to handle all those children so expertly?" or "How can she remain so patient with all the questions?"

It isn't possible to answer all these questions quickly or simply. But if this visitor happened along at a time when another kind of class was studying in the Museum halls he would hear some of the answers, because this other type of class is composed of students from colleges and universities who are studying and training to be teachers.

These classes of teachers-in-training come to the Museum to learn how to make use of a museum as well as other educational resources in a community. Under the direction of a Raymond Foundation staff member the teacher-students can observe other school classes studying in the Museum. They learn what to do and what not to do in bringing a class to a museum. They learn how to plan a trip and to make the important preparations for it in the classroom with their students. They learn what this Museum can do to assist them and what facilities there are here for their use. They discover, usually to their great amazement, that this Museum can be compared to a library where you cannot possibly absorb all the information or use all the material in one visit and that it is much better to use only certain parts as needed. Therefore the teachers-to-be learn what material is available and will know where to go and how to go about using it when needed.

Thus the visitor could readily understand that it is only through study, training, and experience that a teacher learns how to plan a class visit in the Museum and carry it out successfully. It is only necessary to watch an unprepared group struggling through a poorly planned educational trip to see the difference between their confused learning and the good time enjoyed by a class seeing and learning easily under expert direction.

The Museum staff is happy to have a part in helping teachers plan and prepare for better use of the Museum exhibits.

COMING: ADULT LECTURES AND CHILDREN'S MOVIES

On March 4 the Museum will begin both the spring course of illustrated lectures on science and travel for adults on Saturday afternoons, and the Raymond Foundation free motion picture programs for children on Saturday mornings.

The first of the adult lectures will be "Banana Country," by Dr. Arthur C. Twomey, of the Carnegie Institute, Pittsburgh. The lecture will be given in the James Simpson Theatre of the Museum at 2:30 P.M. Reserved seats are available to members upon application in advance.

The first of the children's programs, to be given also on Saturday, March 4, will be "Summer in Idaho." Dr. Twomey will appear on this program also and tell the story of salmon and trout fishing, western rodeos, and flowers and birds of Idaho and the famous Sun Valley. The children's program will begin at 10:30 A.M.

A complete schedule of programs of both adult and children's series will appear in the March issue of the BULLETIN.

'Spoiled' Youngsters . . .

CONDITIONING IN BIRDS

By AUSTIN L. RAND
CURATOR OF BIRDS

TO CONDITION, in psychological terminology, according to my unabridged dictionary, is to attach a subject to a new stimulus or response; it may also mean to produce a new attachment of stimulus and response in a subject. The classical experiments in conditioning and reflexes are those of Pavlov in the last century. The one best known consisted of sounding a bell each time food was given to a dog. Finally the salivary response resulted when the bell was rung even without the food being given to the dog. The dog was *conditioned* to the bell. First it had responded to the food, then to the food and the bell, and finally to the bell alone, by a flow of saliva. The beauty of this experiment is its simplicity, dealing as it does with a single reflex.

Though much behavior is more complex, experiments have been worked out to show how environment, in a broad sense, can influence inherited behavior. An illuminating example of this is one dealing with young loggerhead shrikes and the duration of their infantile behavior. Young shrikes, while in the nest, as with young passerine birds in general, are fed directly by their parents placing food in their mouths. One of the earliest behavior patterns these young birds acquire is to stretch up with widely opened mouth, fluttering wings, and buzzing calls, in anticipation of being fed. This we call begging. Though typically infantile behavior, it may reappear in courtship, but this latter we shall not consider here.

Ordinarily this infantile begging behavior is discontinued shortly after the young birds leave the nest and become able to feed themselves. In a state of nature, observations indicate that this change is probably hastened in part by the young birds themselves, who come to avoid having food thrust down their gullets and prefer to pick up the food for themselves, and in part by the waning interest of the parents in the young, which confers an advantage on those young who early become self-supporting.

CASE OF RETARDED DEVELOPMENT

Certain observations made from time to time have indicated that, though the age at which young birds change from infantile begging for food to self-supporting independence is fixed by instinct, certain external factors, notably the amount of care the young have received, can affect the age at which this change occurs. Indeed, there is a record of a young cedar waxwing raised by hand, who never learned to feed himself.

When I secured a brood of four young loggerhead shrikes, or butcher birds, the material was available to conduct a controlled experiment. The young birds were raised together by hand to the stage at which they were ready to begin to pick up things, to feed themselves, and to begin to abandon their infantile behavior of begging for food. This was when they were 21 days old. They were then divided into two lots and housed separately. One couple had a supply of food kept in front of them, and hand feeding was gradually discontinued and stopped as soon as possible. At the age of 28 days they fed themselves well,

though they still begged freely when I approached. By the time they were 39 days old they begged rarely, and after 45 days they were not seen to beg.

The other two birds had no free food available at any time and were fed completely by hand, the food being placed in their mouths. At the age of 28 days they had made no effort to feed themselves. By the time they were 53 days old they made efforts to feed themselves by trying to peck the food from the fingers instead of having it thrust into their mouths. They evidently would have changed quickly to independent self-feeding and abandoned their infantile begging behavior, but hand-feeding was continued. At the age of seven and one-half months, when the experiment was discontinued, though these birds were capable of feeding themselves, as was seen when food was dropped accidentally on the floor of their cage, they still begged for food from their human foster-parent.

OBJECT LESSON FOR PARENTS

The four birds used in this experiment were nest-mates, with similar hereditary and early environment. The birds in the lot that received only enough care to insure proper development became self-feeding and independent and lost their infantile begging behavior when they were about a month and a half old. The birds of the other lot, which received an excessive amount of care and were hand-fed without being allowed to develop the behavior that would have made them independent, retained the infantile behavior pattern of begging until the end of the experiment. They were then seven and one-half months old, and their nest-mates, under a different set of conditions, had lost their infantile behavior six months earlier.

Thus in some birds it appears that excessive care can be a conditioning factor. It can delay the loss of infantile behavior and the acquiring of normal independence. Though the young shrikes instinctively tried to develop their independent behavior, when this was not possible they continued their dependent conditioned behavior.

STAFF NOTES

At the annual meeting of the Ecological Society of America in New York, Chief Curator of Zoology **Karl P. Schmidt** was elected to the editorial board of the Society's journal, *Ecology* . . . . **Rupert L. Wenzel**, Assistant Curator of Insects, recently studied insect collections in the principal eastern museums . . . . **Donald Collier**, Curator of South American Ethnology and Archaeology, gave an illustrated talk on Peru for the Jackson Park Camera Club . . . . **Paul G. Dallwig**, Layman Lecturer, has extended his leave until next November. He will then resume lectures for Sunday audiences in the Museum . . . .At the recent annual meeting of the Society for the Study of Evolution in New York, **Dr. Theodor Just**, Chief Curator of Botany, spoke on "Fossil Floras of the Southern Hemisphere and Their Bearing on Continental Drift." He was elected secretary of the Society for 1950–52. In New York Dr. Just also attended the annual meeting of the Botanical Society of America, where he made a report on the activities of the Committee on Paleobotanical Nomenclature, of which he is chairman . . . . Several other members of the Museum staff presented papers at the meeting of the Botanical Society. **Dr. Hugh C. Cutler**, Curator of Economic Botany, spoke on "The Phytogeography of Bolivia." **Dr. Julian A. Steyermark**, Associate Curator of the Herbarium, spoke on "The Phytogeography of Venezuela." He was elected secretary of the Systematic Section of the Botanical Society of America. **Dr. L. H. Tiffany**, Research Associate in Cryptogamic Botany, presided over meetings of the Phycological Society of America and presented several papers. **Dr. Francis Drouet**, Curator of Cryptogamic Botany, attended and conducted research at the New York Botanical Garden. **Donald Richards**, Research Associate in Cryptogamic Botany, attended meetings of the American Bryological Society. **Dr. José Cuatrecasas**, Curator of Colombian Botany, spoke on "The Phytogeography of Colombia." He was appointed a member of the organizing committee of the Third South American Botanical Congress to be held in Bogotá, Colombia, in 1953.

NATURE PHOTO EXHIBIT OPENS FEBRUARY 1

The Fifth Chicago International Nature Photography Exhibition will open in Stanley Field Hall of the Museum on February 1. It will continue through February 28. In the display are more than 200 prints and 500 color slides from all parts of the United States and foreign countries as well. These were selected as the best among many times that number submitted.

The Annual Nature Photography Exhibition, sponsored jointly by the Museum and the Nature Camera Club of Chicago, has become a regular feature of the Museum program each February. The increasing popularity of nature photography is evidenced by the fact that there are now eight photographic exhibitions in the United States that are either limited to nature material or else include a nature division. It is gratifying to note that the Chicago exhibition is not only the largest of its kind in the world but that, in spite of its restriction to a specialized field, it is larger than many of the pictorial exhibitions. The number of entries has increased from year to year, and this fifth exhibit bids fair to be still "bigger and better" than all previous ones. Entries were received last year from Argentina, Australia, South Africa, Bermuda, Costa Rica, Canada, England, France, Holland, India, Italy, Mexico, Portugal, Scotland, and Switzerland, and also from Alaska and Hawaii and most of the states.

The Chicago Nature Photography Exhibition is one of the very few shows that meets all of the exacting standards as to management, efficiency, etc., of the Color Division of the Photographic Society of America. As a consequence, this show is rated by the above organization as a "Class A" exhibit.

It has been the policy of the Nature Camera Club to use five judges (rather than three) because a jury of this size provides a better balance of interests and insures a more equitable consideration of each entry. The judges this year are: Emmet R. Blake, Associate Curator of Birds at the Museum; William Dennin, photographic exhibitor, teacher, and writer; Harry Langer, Fellow of the Royal Photographic Society and Associate of the Photographic Society of America; Dr. Julian A. Steyermark, Associate Curator of the Herbarium at the Museum; and Robert K. Wyant, Curator of Economic Geology at the Museum.

In each of the two divisions of the exhibition (prints and color slides), there are three classifications, *Animal Life*, *Plant Life*, and *General*. Silver medals and ribbons will be awarded in the various print and slide classifications. The names of the prize winners will be inscribed on the Myrtle Walgreen plaque. The prints are displayed in fluorescent-lighted panels built especially for this purpose. The slides are displayed in rotation in a display cabinet. They will also be projected on the screen in the James Simpson Theatre on two Sunday afternoons, February 12 and 19, at 3 P.M.

An illustrated catalogue of the exhibit, available early in March, will be published by the Nature Camera Club. A list of the prize winners and reproductions of some of their entries will be featured in the March BULLETIN.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

In the spring of 1900, the Field Columbian Museum added to its staff an osteologist by the name of Edmond N. Gueret to fill a post that had been vacant for more than a year. At the same time there came an enormous collection of skeletons that had been purchased from the renowned Ward's Natural Science Establishment where Mr. Gueret had been engaged in skeleton preparation since 1875. He assisted in installing this nucleus collection, and for forty years practically every skeleton exhibited in Hall 19 was mounted by Mr. Gueret,

The late Edmond N. Gueret

who thus left a notable monument to his skill and devotion to a chosen work. His knowledge of osteology, through sixty-five years of specialization, made Mr. Gueret an invaluable consultant for zoologists, paleontologists, and anthropologists. He died on November 30, 1940.

Horticultural Meeting

On January 18 the American Horticultural Council held a meeting in the Museum, with botanists and horticulturists representing various societies in attendance.

A cellulose-acetate model of a 350-pound Galapagos land turtle is on exhibition in Albert W. Harris Hall (Hall 18).

BLUE MUSHROOMS—

(*Continued from page 3*)

and Dr. V. E. Graham, noted mushroom authority of the Chicago region, I learned that blue is not confined to this species, which has been found in the Chicago area. Other mushrooms having a deep blue to purple color are *Leptonia euchroa*, *Nolanea caelestina* var. *violacea*, *Clitocybe cyanophaea*, *C. ochropurpurea*, *C. laccata* var. *amethystina*, *Cortinarius violaceus*, *C. caerulescens*, *C. caesius*, *C. alboviolaceus*, *C. purpurascens*, *C. iodes*, *C. lilacinus*, *C. michiganensis*, *Russula cyanoxantha*, *Tricholoma nudum*, *T. ionides*, and *T. personatum*, and one of the coral mushrooms, known as *Clavaria amethystina*.

EDIBLE THOUGH ALARMING

According to Dr. Graham, all of these mushrooms are edible, although many people would be loath to pick them at first sight, for the expression "turning blue at the gills" is suggestive of death or of a condition connoting illness or strangulation. One of the bracket fungi, *Polyporus pergamenus*, has a slight violet tinge. Other fungi having a purplish color are *Peziza violacea* and *Poria purpurea*. These three species are inedible.

In addition to the above fungi, Dr. Drouet called my attention to some other fungi that are definitely greenish-blue or bluish-green in color. For example, the common mold that attaches itself to spoiled citrus fruits, such as lemons, has a greenish-blue color and is a species of Penicillium, a relative of the famous *P. notatum*, source of penicillin. Finally, fungi of the family *Helotiaceae* belonging to the sac fungi (Ascomycetes) and known botanically as *Chlorosplenium aeruginascens* and *C. aeruginosum* are responsible for the blue-green or green color found in rotten wood.

All in all, blue is a comparatively rare color among higher fungi, which usually display other colors, including various shades of purple.

COLOMBIAN EXPEDITION MAMMALS RECEIVED

A collection of mammals from the states of Bolivar and Magdalena in northern Colombia has been received from Assistant Curator of Mammals Philip Hershkovitz, leader of the Colombian Zoological Expedition. Mr. Hershkovitz, who has been in the field since December, 1948, has made important collections at seven localities in northern Colombia. This is the first shipment received and contains 755 specimens representing practically all the known species from the region and some not before recorded from Colombia. Monkeys, kinkajous, tayras, sloths, rabbits, squirrels, spiny rats, and bats are well represented and about 65 skeletons of these are preserved.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

AMERICAN SPIDERS. By Willis J. Gertsch. D. Van Nostrand Company, Inc., New York, 1949. xiii+285 pages, 6 text figures, 64 plates (32 in color, 32 gravure). Price $6.95.

Few major groups of animals have been so misunderstood and so much maligned as the spiders. This has largely been due to the myths, folklore, and old-wives' tales that have accumulated through the centuries, as well as to the unreasonably exaggerated, sometimes hysterical "Sunday supplement" accounts that have been published about the very few relatively poisonous species. But the misunderstanding is also the result of the fact that araneology (zoology treating of spiders) has largely been an esoteric field, even to most professional invertebrate zoologists.

The restricted nature of the knowledge about spiders has been accentuated in this country by the almost complete lack of general works on the natural history or biology of spiders in the popular literature. This has been indeed unfortunate, inasmuch as spiders exhibit some of the most remarkable instincts and structural and physiological adaptations to be found in the world of living things. Further, they are animals that for the most part can be observed and exploited with relative ease, both by the laboratory worker and the field naturalist. Hence, the appearance of Dr. Gertsch's book should be of considerable interest to specialist and nonspecialist alike.

Dr. Gertsch first treats such general subjects as "Introducing Spiders," "The Place of Spiders in Nature," "The Life of the Spider," "Silk Spinning and Handiwork," "Courtship and Mating," and "The Evolution of Spiders." These chapters are followed by general accounts of the major groups of spiders, "The Tarantulas," "The Cribellate Spiders," "The Aerial Web Spinners," and "The Hunting Spiders." "Economic Importance" and "The North American Spider Fauna" conclude the book.

Relatively few technical terms are employed (a short glossary is included at the end), and the text is, on the whole, very readable and enjoyable. The subject material is fascinating. Color and gravure plates (all photos) are lavishly used. As photographs they are mostly excellent, though one may take issue with some of the choices, arrangement, and duplication. The separate numbering of the gravure and color plates is annoying.

American Spiders is a "must" on the list of anyone really interested in natural history. It is a valuable reference as well as unusually interesting reading. It is one of a series, the "New Illustrated Naturalist," that obviously is intended to be the American counterpart of the admirable and eminently successful British series, "The New Naturalist."

RUPERT L. WENZEL
Assistant Curator of Insects

WEBS IN THE WIND—The Habits of Web-weaving Spiders. By Winifred Duncan. The Ronald Press Company, New York, 1949. 387 pages, 74 plates, 101 figures. Price $4.50.

Museum zoologists are well aware of the inexhaustible opportunities for the study of the habits and behavior of animals, and of the fact that studies of this nature, begun at the amateur level, are likely to develop a serious and even lifelong interest on the part of the student. So little is known in this field, and the animal kingdom is so vast and varied, that such life-history studies soon produce contributions to knowledge and blossom forth in technical, semipopular, and popular publications. The respect in which the work of Jean Henri Fabre is held by entomologists, as well as the volume of his work, is perhaps the most familiar example of this phenomenon.

All this is exemplified in Miss Duncan's book on the habits of spiders. She could scarcely have chosen a group more likely to lead her from a personal to a scientific interest and from popular writing to scientific contributions. There is, of course, a large technical literature on spiders and their habits, and *Webs in the Wind* refers to it and draws upon it. Her occasional misinterpretations of zoological relations do not at all mar her original work.

While it may not be essential to be an artist to engage in studies on animal habits, it is quite evident from the abundant, effective, and distinguished illustration of the present book from Miss Duncan's own efforts that such ability is a major asset, better, perhaps, than even photography. It is pleasing to observe that the author has been brought into contact with museum workers, who will now regard her as a colleague. "Natural History," as that branch of zoology that best bridges the gap between science and the reading public, needs work of the distinction of Miss Duncan's book. She is to be congratulated and thanked by both scientists and public.

KARL P. SCHMIDT
Chief Curator of Zoology

Technical Publications Issued

Fieldiana: Botany, Vol. 24, Part VI. *Flora of Guatemala.* Paul C. Standley and Julian A. Steyermark. December 27, 1949. 440 pages.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

From: William Culberson, Cincinnati—52 specimens of fungi, Cincinnati region; Dr. Maxwell S. Doty, Evanston, Ill.—79 specimens of hepatics, Oregon and California; Dr. Humberto de Andrade, Fortaleza, Ceará, Brazil—5 specimens of carnauba wax, representing official classifications in Brazil; Dr. William Randolph Taylor, Ann Arbor, Mich.—56 specimens of algae, Bermuda; Barbara Calhoun, Milwaukee—82 herbarium specimens, Ecuador; Colegio Salesiano, Lima, Peru—60 herbarium specimens, Peru; Illinois State Museum, Springfield, Ill.—72 herbarium specimens, Illinois.

Department of Geology:

From: Stuart H. Perry, Adrian, Mich.—2 slices of Hill City and Weaver meteorites, Kansas and Arizona, respectively; Rodney L. Bell—17 brachiopod specimens, Tennessee.

Department of Zoology:

From: Raffles Museum, Singapore—6 bats (two topotypes), Malay States; Chicago Zoological Society, Brookfield, Ill.—54 birds; Col. E. N. Wentworth, Chicago—5 selected skulls of pedigreed domesticated hogs; Lincoln Park Zoo, Chicago—7 birds and a new-born three-toed sloth; Dr. Jeanne S. Schwengel, Greenwich, Conn.—65 specimens of marine mollusks and 29 specimens of marine shells; Boardman Conover, Chicago—18 miscellaneous fresh-water fishes and a golden-eye duck, India and Illinois, respectively; Laura Brodie, Chicago—4 fishes, South Carolina; Lewis E. Long, Washington, D.C.—2 lizards, 2 frogs, and 9 crabs, Nicaragua; Ross Tarrant, Wilmette, Ill.—45 specimens of aquarium fishes and 2 fish skeletons (a blue marlin and a white marlin); Lieut. John F. Kurfess, Hinsdale, Ill.—4 lizards, Ulithi Islands and Falalap Island; Dr. Harald Sioli, Belem, Pará, Brazil—86 specimens of land and fresh-water mollusks, Brazil; Eduardo F. Acosta y Lara, Montevideo, Uruguay—7 bats, Brazil; N. H. Duckworth, Chicago—a turtle, Borneo; Rodger D. Mitchell, Wayne, Ill.—14 lots of fresh-water mollusks and other invertebrates, Missouri and Michigan; Frederick Greeley, Madison, Wis.—9 bats, Wisconsin; Dr. Clarence J. Goodnight, Lafayette, Ind.—3 lots of fresh-water shells, Mexico.

Library:

From: L. S. B. Leakey, Curator of the Coryndon Memorial Museum, Nairobi, Kenya; and L. J. McCormick, La Fontanette, St. Tropez (Var), France.

Museum Membership

Membership in Chicago Natural History Museum assists one of the world's greatest scientific museums to continue research work of fundamental importance and helps to support cultural and educational activities that benefit approximately 2,000,000 people annually, including hundreds of thousands of school children.

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Members are requested to inform the Museum promptly of changes of address.

*NO SINGLE THING ABIDES**

No single thing abides; but all things flow.
Fragment to fragment clings—the things thus grow
Until we know and name them. By degrees
They melt, and are no more the things we know.

Globed from the atoms falling slow or swift
I see the suns, I see the systems lift
Their forms; and even the systems and the suns
Shall go back slowly to the eternal drift.

Oh Science, lift aloud thy voice that stills
The pulse of fear, and through the conscience thrills—
Thrills through the conscience the news of peace—
How beautiful thy feet are on the hills.

*This is a translation by W. H. Mallock of the first, second, and last (twenty-second) stanzas of the poem by the Roman poet Lucretius (Titus Lucretius Carus, 96–55 B.C.).

DID DARWIN FORESEE THE HYDROGEN BOMB?

Believing as I do that man in the distant future will be a far more perfect creature than he now is, it is an intolerable thought that he and all other sentient beings are doomed to complete annihilation after such long-continued slow progress. To those who fully admit the immortality of the human soul, the destruction of our world will not appear so dreadful.

From *Life and Letters of Charles Darwin*

STAFF NOTES

D. Dwight Davis, Curator of Vertebrate Anatomy, has been appointed Lecturer in the Department of Zoology at the University of Chicago .... **Rupert L. Wenzel,** Assistant Curator of Insects, has returned from a study trip to the principal eastern museums in the course of which he received gifts of specimens, loans for study, and important information on type specimens .... **Mrs. Meta P. Howell,** Librarian, and **Mrs. Eunice M. Gemmill,** Associate Librarian, attended the American Library Association Conference in Chicago on January 27 ... **Karl P. Schmidt,** Chief Curator of Zoology, addressed the Kumlien Club of Madison, Wisconsin, speaking on "The Saga of Professor Henry A. Ward."... **Dr. Julian A. Steyermark,** Associate Curator of the Herbarium, has been appointed a member of the Conservation Committee of the Friends of Our Native Landscape. Among his recent speaking engagements are: Barrington Women's Club, on "Exploration in the Lost World of Venezuela"; Chicago Aquarium Society, on "Experiences in Collecting Plants"; and Conservation Council, on "The Effects of Dams on Vegetation in the Ozarks."... **Dr. Paul S. Martin,** Chief Curator of Anthropology, and **Donald Collier,** Curator of South American Ethnology and Archaeology, recently conferred with Dr. James Arnold, of the Institute for Nuclear Studies, regarding chronological problems in North American archaeology. Dr. Martin lectured before the American Ceramic Society. He, Curator Collier, and **George I. Quimby,** Curator of Exhibits, attended meetings of the Chicago Anthropological Society and the College Art Association. They and other members of the Department also conferred with Dr. Ernest Beaglehole, of Victoria College, University of New Zealand, concerning anthropological problems in New Zealand.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

From: Donald Richards, Chicago—270 bryophytes, Alaska; Natural Resources Sec., Div. of Forestry, GHQ, SCAP—40 wood specimens, Japan; Dr. Hugh C. Cutler, Chicago—120 herbarium specimens, Brazil and Bolivia; William Jewell College, Liberty, Mo.—43 herbarium specimens, Missouri; Botanical Museum, Harvard University, Cambridge, Mass.—92 herbarium specimens, Brazil and Colombia.

THIS MONTH'S COVER

"If winter comes, can spring be far behind" seems to fit appropriately this March snow scene of trees laced with snow and ice. The photograph is the work of Godfrey Lundberg, color photographer for the *Chicago Sunday Tribune*, who entitles it "Fairyland." The picture was made in Harms Woods, west of Wilmette, Illinois, on the north branch of the Chicago River. It was shown in the Fifth Chicago International Nature Photography Exhibition at the Museum during February.

Department of Geology:

From: Dr. and Mrs. Rainer Zangerl, Harvey, Ill.—a fossil mammal jaw, late Eocene, Utah; Morgan Davis, Humble Oil & Refining Co., Houston, Tex.—gypsum crystals with sand inclusions, Texas; H. V. Feltwell, Altoona, Pa.—a fossil impression of part of the trunk of a giant club-moss (*Lepidodendron* sp.), Pennsylvania.

Department of Zoology:

From: Pacific Science Board, Washington, D.C.—89 Hymenoptera, Micronesia; Chicago Zoological Society, Brookfield, Ill.—a macaque, an Old World badger, and a giant anteater; William H. Stickel, Laurel, Md.—210 frogs (including one type and 2 paratypes) and 6 frog skeletons, Philippine Islands; Dr. C. Andresen Hubbard, Tigard, Ore.—206 fleas on 86 microscope slides, western United States; Princess Sigismund of Prussia, Barranca, Costa Rica—5 snakes, 4 bats, 5 insects, 4 scorpions, and a pedipalp, Costa Rica; Maj. Robert Traub, Washington, D.C.—30 fleas, Mexico; Princeton University—51 frogs, 56 lizards, and 5 snakes, Argentina; Lillian A. Ross, Chicago—a frog and a lizard, Cuba; Dr. Hans Schlesch, Copenhagen, Denmark—a collection of fresh-water mollusks, northern Germany, and a collection of fresh-water clams, various sources; Julius Friesser, Chicago—a jaguar skull, Brazil; Harry Hoogstraal, Chicago—a collection of land mollusks, Madagascar; Ross Tarrant, Wilmette, Ill.—a fish, Florida.

Library:

From: José M. Tristan, Rochester, N.Y.; Dr. Fritz Haas, Chicago; Dr. Henry Field and the Pakistan Embassy, Washington, D.C.

Take It Easy

Do not attempt to see everything in one Museum visit, whether you have half an hour or a day. It has taken 56 years to assemble the Museum exhibits. They are arranged in 48 halls that cover 542,400 square feet of floor space (12.5 acres). So don't expect or hope to see and enjoy them all at one time.

FREE SATURDAY AFTERNOON LECTURES, MARCH AND APRIL

The annual Spring Course for adults of free illustrated lectures on travel and science will cover a wide geographic range—Central and South America, Japan, Africa, Alaska, Australia, and parts of the United States. The lectures will be presented each Saturday afternoon of March and April at 2:30 P.M. in the James Simpson Theatre of the Museum. Motion pictures in color will accompany all of the lectures except one, for which slides will be used.

Limited accommodations make it necessary to restrict these lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lecturers:

March 4—BANANA COUNTRY

Arthur C. Twomey

Dr. Twomey, Director of Education and Curator of Ornithology at the Carnegie Institute in Pittsburgh, is widely known as an explorer-scientist. He brings his latest color film from expeditions in Spanish Honduras, a land of tangled jungles and forests of bananas. The film includes a visit to the islands that Columbus discovered and to Tegucigalpa, ancient capital of Honduras, and shows tropical birds never before photographed in their natural haunts, cloud-cloaked mountains, and tropical jungles studded with orchids.

March 11—JAPAN JOURNEY

Karl Robinson

In "Japan Journey" Mr. Robinson tells about one of the most important roles of America in world peace. His motion-picture story of the United States Army of Occupation and its achievements in leading a people from an autocratic feudal regime into a democratic industrial economy ranges from Hokkaido at the northern extremity of Japan to Kyushu in the south and covers postwar Hiroshima. Other features are the climb of Mt. Fuji, the shooting of the Hozu Rapids, and pearl divers of Ago Bay.

March 18—LAND OF ENCHANTMENT

Alfred M. Bailey

An all-color film provides nature studies in the beautiful land traversed by the Conquistadores 400 years ago. Shown are ancient pueblos and present-day Indian villages of the Rio Grande, old Santa Fe in spring and during the fiesta, Taos and the great Indian pueblo near by, and intertribal Indian ceremonies in Gallup. Dr. Bailey, Director of the Denver Museum of Natural History, has appeared for eleven consecutive years on Museum lecture programs and is well known to audiences here.

March 25—CONTRASTS OF CHILE

Clifford J. Kamen

In narrative and color films Mr. Kamen tells the story of his journeys through the entire length of Chile over the highest mountains in the Western Hemisphere. In southern Chile, one of the wettest places on earth, a region of fog, violent rain, and storms, visits are made to some of the most primitive Indians. The film includes a transit of the Strait of Magellan and a flight out to Cape Horn.

BRONZE BUDDHA, JAPAN

From film "Japan Journey," which will accompany March 11 lecture by Karl Robinson

April 1—GORILLA HUNT

R. Marlin Perkins

Mr. Perkins, Director of Lincoln Park Zoo, has custody of the most extraordinary of all living captive gorillas, the famous Bushman, now more than 21 years old. It is natural that he should look ahead to the need for replacing Bushman and try to get an "understudy." How he obtained not one but three understudies and how he acted as nursemaid in bringing them home is the subject of Mr. Perkins' lecture and colored slides.

April 8—ALASKA WILDLIFE

Cecil E. Rhode

In his lecture and film Mr. Rhode presents the high spots of his twelve years of residence in Alaska. The film shows big game in Kenai Peninsula, with close-ups of game fish, mammoth bears, big-horn sheep, bull moose, and other animals.

April 15—TRAVEL TRAILS OF THE ANDES

Herbert Knapp

Mr. Knapp begins his story and film with a visit to the plateaus of Ecuador and Peru where picturesque Indians and strange camel-like llamas live. He then shows the colorful sights of Lima, the Peruvian capital; Arequipa, the country's second city; and Cuzco, atop the southern Andes, capital of the fabulous Inca civilization that was old before the Spaniards arrived.

April 22—ABORIGINAL AUSTRALIA

F. M. Setzler

Mr. Setzler's lecture and motion pictures tell the story of the Arnhem Land Expedition of 1948, an international undertaking sponsored by the National Geographic Society, Smithsonian Institution, and the Commonwealth of Australia. The primary activity of the expedition was the study of the aborigines of northern Australia, but the color film illustrates also the plants flowers, animals, birds, and scenic features of the country.

April 29—AMERICA OUT-OF-DOORS

Victor Coty

The world of nature as seen by a sportsman is the subject of this lecture. Color films show figure skating at Lake Placid, champion skiers in spectacular action on snow trails and jumps, mountain climbing, sailing races at Nantucket, salmon and trout fishing, bass and musky fishing in Algonquin Park, big-game fishing off Cat Cay in the Bahamas, and ruffed-grouse hunting in New Hampshire and Vermont.

RESERVED SEATS FOR MEMBERS

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the lecture day.

Schedule of free Saturday morning movies for children on page 7.

Visiting Hours Change March 1

Beginning March 1, spring visiting hours, 9 A.M. to 5 P.M., will replace the winter schedule of 9 to 4. The new hours will continue in effect until April 30.

EXHIBIT TELLS STORY OF BIRDS' NESTS AND EGGS

By AUSTIN L. RAND
CURATOR OF BIRDS

AN EARLIER bird exhibit in Hall 21 illustrated how nests may have evolved from crude and scanty structures to elaborate and well-made cradles for the young. In most arrangements in nature there are many loose ends—things that do not fit, special adaptations to unusual conditions. There may be lines of evolution that were "tried" and, although unsuccessful, have lingered on. This became evident in planning the first case of birds' nests because many nests did not fit into the series. Some of these nests were so striking, so illustrative of the ramifications of adaptation, that a second exhibit was planned for them, combined appropriately with an exhibit of birds' eggs.

GUIDANCE FOR STUDENTS

Margaret G. Bradbury, Museum Artist, demonstrating to two Antioch College girls how the new exhibit of birds' nests and eggs can be used as material for art work.

The most conspicuous object in the exhibit is the hornbill's nest. A male giant hornbill is clinging to the trunk of its nesting tree. Inside the nest tree, in the nest hole, which is a natural cavity, is the female bird with only the tip of her bill visible, for the entrance to the nest hole has been plastered up until the opening is too small for her to come out. This is an amazing habit of many hornbills. At nesting time the male and female working together seal up the entrance to the nest cavity, the female from the inside. The female stays in the nest during the whole period of incubation and through part at least of the nestling period of the young. The male brings her all her food during her retirement and feeds her through the slit-like opening. This is a voluntary retirement of the female and not an imprisonment by the male, as has been suggested. When the female finally does emerge, she simply bursts her way out.

INTERIOR DECORATION

Next to the hornbill nest is one of the crested flycatcher, which can be found in the Chicago area. The nest is in a crevice and the noteworthy feature is a snakeskin as though for decoration, something crested flycatchers almost always add to their nests and for which no adequate explanation has been offered.

The mud nests shown are of four different types. A shelf-like black phoebe's nest built up of mud pellets and the flask-like nest of mud pellets of the cliff or eaves swallow, both stuck to a wall or a cliff, represent two types. The third is of mud throughout, the domed nest of the South American oven bird, whose Portuguese name, being interpreted, means "John of the mud." It is claimed in Brazil that *Juan do barro* will not work at its nest-building on Sunday. The fourth nest showing use of mud is that of the American robin, in which there is a concealed mud lining.

The four-storied yellow warbler's nest was an attempt of the female yellow warbler to avoid hatching a cowbird's egg. The cowbird makes no nest of her own and lays her eggs in the nests of other species of birds, to have her young raised by foster parents. She is a social parasite like the common cuckoo of Europe. Instead of docilely incubating the intruded strange egg, the yellow warbler will occasionally bury it, sometimes along with some of its own, in the bottom of the nest, and this process may be repeated more than once if the cowbird lays again in the same nest.

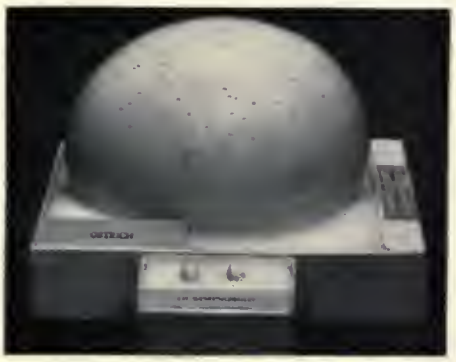
People sometimes put out string, yarn, or cotton wool for birds to use in building their nests, and the birds, which use whatever is available and suitable, may then make gaily colored nests, as is shown in the exhibit by comparison of the oriole's nest of string and yarn with one of natural fiber.

SOME WANT SPACE

There is usually a rough correlation between size of nest and size of bird; the stork or the eagle may make a nest yards across, while that of a sparrow will be only inches across. But the relation between size of nest and size of bird is only approximate as is shown in the exhibit by the olive-sided flycatcher, with a small, neat, cup-shaped nest, and the dipper, a bird about the same size as the flycatcher but with a much larger nest of living moss.

The swifts are the only birds of which I know that use a secretion from their salivary glands as nest material. Our common chimney swift's nest is made mostly of sticks, but they are stuck together as well as stuck to a hollow tree or the inside of a chimney with the bird's saliva. In the Orient there is a group of cave swiftlets that makes its nests entirely of saliva, and these are the nests that are used in the making of "bird's-nest soup." In the exhibit we show not only a chimney swift's and a cave swiftlet's nest but also a sample of the cave swiftlet's nest material as it is sent to market and a sample of the prepared material as it is sold in packages in Chicago ready to be put into soup.

We have pointed out that size of nest does not correspond exactly with size of bird, and the same is true of eggs. The most obvious discrepancy is between two birds of almost the same size where one has "altricial" young (hatched blind, nearly naked, and helpless) and the other has "precocial" young (down-covered and active soon after hatching). The precocial young need more food in the egg and the eggs of precocial birds are correspondingly larger than the eggs of altricial birds of the same size. This we have illustrated with the



CONTRASTS IN SIZE

An egg of the largest living bird, the ostrich, and the tiny eggs of a hummingbird.

spotted sandpiper and the robin and their eggs, and in the adjoining case on the breeding habits of birds.

CONCEALING COLORATION

Concealing coloration in birds, that is, matching of the color of the eggs or of the birds with their background so that a predator may not find them easily, is one of the striking adaptations in the animal world. The nighthawk's eggs in the exhibit blend so well with the pebbles on which they are laid that it is not easy to tell one from the other.

Shape in an egg may correlate with where it is laid, as we illustrate with the murre's egg on a ledge of rock. Its sharp taper causes it to roll in a small circle when it is disturbed, and thus is it less easily rolled off the ledge than if it were of normal egg shape. The floor of the case is devoted to the general topic of birds' eggs. "Egg-shape" as a term is usually restricted to the shape of the hen's egg, ovate or a modified oval, broader at one end. But the shapes of birds' eggs vary widely, approaching roundness in the owls, sharply pointed at one end in murres and shore birds, and elongate, with both ends nearly equally rounded, in the albatross.

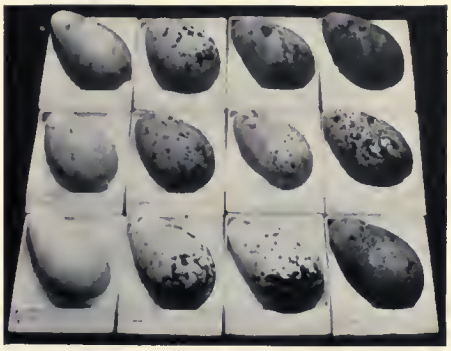
While the size of eggs does not correlate exactly with the size of the birds, the largest eggs are certainly laid by large birds and the smallest eggs by small birds. They vary from the tiny pea-sized egg of the hummingbird to that of the ostrich, giant among living birds, and the still larger, extinct *Aepyornis* or elephant bird. For comparison, the following measurements are of interest:

Species	*Length of Egg* Inches	*Weight of Egg* Grams
Humming bird	.5	0.5
Leghorn fowl	2.4	58
Ostrich	6.6	1,400
Aepyornis (Madagascar, extinct)	12.2	12,000

The glossy eggs of tinamous, which gleam like polished gems, contrast with the chalky egg shell of the cormorant, in which the blue color of much of the shell is hidden by an outer limey deposit. These show two extremes in the surface texture, with the egg of a duck and hen somewhere between. Other variation is seen in the pebbled surface of the cassowary and emu egg, in which each raised pebble is a spot of darker color against the depressed, paler background, and in the little pits in the surface of the ostrich egg.

VARIATION IN COLOR

It is the beauty of color in birds' eggs that started many a boy of an earlier generation to making an egg collection. We have shown in the exhibit some of the variations in color: the uniform white egg of the shearwater, the dark blue of the catbird, the greenish color of the duck, and the gray of the tinamous. Other ground colors, such as buff and pink, are heavily marked with specks, spots, splashes, blotches, or lines. Pink or some shade of reddish brown to almost blackish is the common color for markings. Often some of these have a gray



VARIABILITY WITHIN UNIFORMITY

The eggs of one kind of bird tend to be of a characteristic color, with characteristic markings. Variability is the rule in nature, however, and the murre's eggs shown, all of one species, illustrate extreme variation.

or lilac tinge, which is produced by the color spot being below the surface and overlaid with shell color. Sometimes, as with the black tern and the ptarmigan, the spots cover more of the egg shell than does the ground color. The blue and white eggs of the guira cuckoo are strikingly different from all the others in having a dark blue background and white markings.

Each kind of bird lays a special kind of egg, but there can be wide variation within the species. In the case is a set of golden eagle eggs, one of which is of normal color while the other is white. A set of ptarmigan eggs has one freak white egg and one runt egg. In addition to freaks there is normal variation, greater in some species than in others. This is shown by the murres' eggs with background from white to green and blue, which vary from almost immaculate to heavily marked.

Sometimes relationship is indicated by eggs, as is the case with the pointed eggs of auks, murres, etc., and of the shore birds. Most New World blackbirds have eggs with "scrawls" on them. Within a family there may be great diversity, as indicated by the exhibit of sparrows' eggs, which show types ranging from white to heavily colored, immaculate to heavily marked, and markings from specks to heavy blotches and lines.

The number of eggs a bird lays is more or less constant for a species. Some species, like albatrosses and shearwaters, some penguins, and some tropical pigeons, typically lay but a single egg; two is the normal set for our mourning dove, ruby-throated hummingbird, and nighthawk. Many of our common garden songbirds lay from three to six eggs. Many ducks, grouse, and quail lay large sets of eggs. The largest set in our collections is a bobwhite quail clutch of twenty-two eggs.

The eggs of local nesting birds are represented by a selected series of some of the commoner species.

ZOOLOGISTS WILL STUDY ANIMALS OF BORNEO

The animal life of Borneo, third largest island in the world, will be studied by members of an expedition leaving the Museum on March 19. D. Dwight Davis, Curator of Vertebrate Anatomy, and Robert F. Inger, Assistant Curator of Fishes, will first fly to Singapore, where they will consult with scientists in the Raffles Museum. At Kuching, capital of Sarawak, they will discuss plans with local naturalists who have lived in Borneo for many years. The expedition will make its headquarters at Sandakan, capital of the province of North Borneo, and will remain in the field for about six months.

Borneo is famous chiefly for the head-hunting "wild men," stock in trade of circuses a generation ago, and for the great red-haired orang utan and grotesque proboscis monkey, whose colossal nose looks like a caricature of "Schnozzle" Durante. But as often happens, the smaller animals are of most scientific interest. It is from these smaller fry, most of them even lacking common English names, that biologists hope to get some of the answers to the greatest riddle of all, the riddle of evolution.

Field zoologists in the past have concentrated mostly on collecting and preserving animals, working feverishly to get as large a sample as possible during their all too short stay in the field. Such collections form the basis for the relentless search for new species, the gigantic task of inventorying the animal life of the world that is still far from completed. Little can be learned of the habits and behavior of animals from these dead specimens, and lack of exact information of this kind is a serious handicap to many kinds of biological research. Davis and Inger hope to concentrate on studying the habits and behavior (such as locomotion) and ecological relations of the animals of North Borneo rather than amassing as large a collection of preserved specimens as possible.

Visitors desiring to use wheel chairs may rent them at the Main (North) Entrance for a fee of 25 cents an hour. A deposit of $1 is required on each chair. Attendants must be furnished by the applicants.

A hen is only an egg's way of making another egg.

SAMUEL BUTLER, in *Life and Habit*

THE EARLIEST VERTEBRATES WORE HEAVY ARMOR

By ROBERT H. DENISON
CURATOR OF FOSSIL FISHES

It was an exciting event in the scientific world when, in 1891, Charles D. Walcott, of the United States Geological Survey, announced the discovery of remains of vertebrates in rocks that were deposited on the shores of an Ordovician sea about 400 million years ago. Skeptics, both in this country and abroad, questioned his dating of the rock formation, and many geologists and paleontologists visited his site near Canon City, Colorado, to check the facts for themselves. But today Walcott's dating remains essentially unchanged, and other similar finds have been made elsewhere in Colorado, in Wyoming, and in South Dakota to confirm it.

FAST-SWIMMING PREDATOR OF 315 MILLION YEARS AGO

The Late Devonian Dinichthys, with armor much reduced compared to earlier forms known as Osteacoderms, was more than five feet in length and a jawed vertebrate. Redrawn from Heintz by Artist John Conrad Hansen.

The tremendous interest aroused by this discovery is due in part to the fact that we ourselves are vertebrates and those of us who have an active scientific curiosity are anxious to trace our ancestry back as far as possible. Also, in vertebrates as old as Ordovician, we might hope to find some direct evidence as to how our own group evolved from an invertebrate ancestor. Unfortunately, all of the remains of these earliest known vertebrates are too poorly preserved to be of much help in answering these questions. The small fragments of their bony armor have the same microscopic structure that is found in later, better-known vertebrates but are insufficient to give us any idea of the structure or appearance of the animals themselves.

SLUGGISH BOTTOM FEEDERS

To get any idea of the organization of the vertebrates, we must go to Late Silurian rocks, deposited about 50 or 60 million years later. In many and widely scattered parts of the earth have been found a variety of peculiar, small, fish-like vertebrates, commonly known as ostracoderms. Almost all of them possessed a heavy bony shield, covering both the head and the trunk. Whatever purpose it served in their ancestors, the shield probably was useful as an armor to protect the ostracoderms from their predaceous contemporaries, the eurypterids, distant relatives of the living king crabs.

Poor swimmers the ostracoderms must have been, for most of them did not have a streamlined body or any paired fins. Their only organ of propulsion and steering was their tail, which was covered with small bony plates. They must have spent much of their life on or near the bottom of streams, swimming at best no more adeptly than a tadpole. Of great importance is the fact that they did not have any real jaws, as do all later vertebrates, for without jaws they couldn't have done any very successful biting. Many of them may have fed by drawing in a large mouthful of water with its contained food particles (and probably mud), then filtering out the food as the water was expelled through their gills.

While the ostracoderms were the only vertebrates and had only the invertebrates to contend with, they were a very successful group. They evolved into a number of diverse lines and were numerically very abundant in some regions. But with the arrival of real fishes on the scene in Devonian times, the ostracoderms showed a rapid decline. Some of the earliest of these fishes were not unlike the ostracoderms in general appearance. They were heavily armored forms, without any paired fins at first. They also must have been poor swimmers, mostly bottom dwellers and feeders.

HEAVILY ARMORED AND JAWLESS

This creature, called Pteraspis, only about eight inches long, typifies the early fish-like vertebrates known as Osteacodeems. It lived about 350 million years ago. Redrawn from White by John Conrad Hansen, Museum Artist.

FIRST PREDACEOUS FISHES

But they had one important structural advantage. One of their front gill arches had bent around the enlarged mouth opening to form a pair of real jaws. With this biting mechanism developed, the Devonian period witnessed the evolution of many lines of fast-swimming, predaceous fishes, able to prey on ostracoderms as well as the numerous invertebrates that lived then in the streams and seas. The armor shield, no longer necessary for protection and in weight and stiffness a liability to a fast-swimming fish, was reduced or lost.

Ostracoderms and early fishes, of which there were few in the Museum's collection, are now represented by a considerable variety, obtained by last summer's expedition to the Rocky Mountain region. Samples of the earliest vertebrates were obtained from the Ordovician rocks of Canon City and elsewhere in Colorado. Ostracoderms and primitive armored fishes were collected in Wyoming and Utah. Additional collections were made from Late Devonian rocks, whose faunas include a number of groups of fishes very similar in general appearance to those living today. Among the latter, in the lobe-finned fishes (or Crossopterygians), we can find our own remote ancestors.

NEW MEMBERS

The following persons became Museum Members between January 16 and February 13:

Contributors

Henry S. Dybas

Associate Members

Dr. W. F. Geittmann

Sustaining Members

Robert L. Burke

Annual Members

Robert S. Arthur, Mrs. W. R. Arthur, Gerald A. Barry, Dr. Therese Benedek, Miss Ruth Bishop, A. C. Boitel, B. T. Brennan, R. O. Byerrum, Charles A. Capek, T. R. Chadwick, James Chapman, Zarko Chirich, Paul C. Clovis, Miss Rose Ann Drago, John M. Faulhaber, Mrs. Charles C. Fitzmorris, Sr., Joseph G. Fuhry, Earl M. Garman, Dr. Samuel Garrick, Henry H. Haupt, Dr. Emil D. W. Hauser, James D. Head, H. G. Heller, Charles W. Hills, Dr. S. S. Hollender, Mrs. Frederick A. Ingalls, E. A. Krider, Jerome Kritchevsky, Sidney Landis, Maurice H. Lockwood, Charles M. Miller, Mrs. Kretschmar Mock, George A. Nikopoulos, Mrs. Henry Regnery, William F. Rowley, Edward P. Rubin, Charles F. Scully, A. L. Spear, Paul Stephens, H. B. Thoresen, John B. Ughetti, Dr. H. J. Urban, Allen M. Weary, Lyle S. Whitmore.

Books . . .

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

TALKING ANIMALS. By Wilfrid D. Hambly. The Associated Publishers, Inc., Washington, D.C., 1949. 100 pages, illustrated by James A. Porter. Price $4.

Dr. Wilfrid D. Hambly, Curator of African Ethnology at Chicago Natural History Museum, has the esteem of his colleagues in anthropology for his detailed and conscientious reports on native African cultures, and his valuable guides to the study of African ethnology and the collections of the Museum. As his recent books indicate, however, he acquired on his various expeditions not only a body of scientific data and thousands of specimens, but also a sensitive feeling for native modes of thinking and values, and the way these are reflected in their lore. *Jamba*, published some time ago, is a fictionalized biography of a member of the Ovimbundu tribe in Angola which combined, with a success that is very rare, creative imagination with authenticity of atmosphere and background.

Talking Animals is a collection of West African animal stories gathered in the field by Dr. Hambly, some of them published before in a scientific report, retold here in simple fashion for children. Animal stories have a venerable tradition in this country. The city-child of our time may not know much of Brer Rabbit, with so many of his plots and so much of his flavor testifying to his African origins; yet the popularity of animal actors continues in cartoons, films, and in books written for children. Among the latter, there is a growing body of tales that stem from the traditional lore of preliterate peoples, and *Talking Animals* is a welcome addition. Animal stories are especially rich and varied on the African continent. They mirror realistic observation of animal behavior, but they also embody much commentary on social life and on human character traits, thinly disguised behind humor and the animal figures. No doubt they play an important role in the home education of the African child.

Many of our stories show that the African parent, too, has to cope with numberless "why" questions. The reader or listener can learn here why Turtle's shell is cracked, how Baboon lost his long tail, or why cats do not work any more for hens, as they used to; but also that things like bullying, bragging, or thievery lead to no good end. The favorite heroes, Hare, Spider, and Turtle, outwit the large animals in numerous encounters, and even Caterpillar has his day of bravery. But too much cunning or meddling will get the hero into trouble too. Other stories are of interest because they are really riddles, for instance, why a hen can call a crocodile her brother.

Talking Animals promises to be very pleasant entertainment for the audience for which it is intended. There is a useful and unpretentious commentary throwing light on the background of the stories and the way they are told in their native setting, and the illustrations add to the effectiveness and simple charm of this book.

GEORGE HERZOG
Professor of Anthropology,
Indiana University

MOVIES FOR CHILDREN SATURDAY MORNINGS

Nine free programs of motion pictures for children will be given on Saturday mornings throughout March and April in the James Simpson Theatre of the Museum. This is the Spring Series of the James Nelson and Anna Louise Raymond Foundation. All of the programs begin at 10:30 A.M. On three of the programs the explorers who made the films will appear in person and tell the story of their adventures.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are neeeded.

Following is an outline of the programs:

March 4—SUMMER IN IDAHO
Fishing, rodeo, flowers, and birds
Talk by Arthur C. Twomey

March 11—WE LIVE IN ALASKA
The Robinson family in Alaska
Talk by Karl Robinson

March 18—THE CAJUN COUNTRY
Life in the Louisiana swamps
Talk by Alfred M. Bailey

March 25—TALES OF THE WOODLANDS
Peter, Molly, and Angela go exploring

April 1—ANIMAL LEGENDS
Also a cartoon

April 8—ANCIENT PALESTINE
2,000 years ago

April 15—ARRIVAL OF SPRING
Also a cartoon

April 22—CHINA TODAY
Also a cartoon

April 29—JUNGLE BOOK
Kipling's famous story

LECTURE TOURS IN MARCH DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Mar. 1—Struggle for Existence—Plants and Animals (*Miriam Wood*).

Fri., Mar. 3—Life in the Water. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Mar. 8—Keeping Up with the Joneses—Entertaining for Prestige (*Harriet Smith*).

Fri., Mar. 10—The Earth Blows Her Top—Volcanoes. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Wed., Mar. 15—"Be It Ever So Humble"—Housing Around the World (*June Buchwald*).

Fri., Mar. 17—Snake Stories. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Mar. 22—Chicago's Prehistoric Past (*Anne Stromquist*).

Fri., Mar. 24—The Gift of Green. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Mar. 29—Plants with Romantic Stories (*Marie Svoboda*).

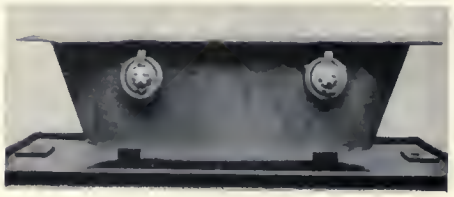
Fri., Mar. 31—Museums, Old and New—Purpose of Museums and How They Have Changed. Illustrated introduction in Meeting Room (*Miriam Wood*).

Persons wishing to participate should apply at North Entrance. Tours are free.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The bronze Roman bathtub that still has a conspicuous place in Stanley Field Hall was received in 1900 as a gift with other archaeological objects from Edward E. Ayer and friends of the Museum. The collection



Ancient Roman bathtub

that included the bathtub was from Boscoreale at the foot of Mount Vesuvius. This material was reported on for the Museum publications by Herbert F. de Cou, who was later assassinated by Arabs at Cyrene, in North Africa, while engaged in archaeological studies.

FIFTH CHICAGO INTERNATIONAL NATURE PHOTO CONTEST AWARDS ANNOUNCED

With the Fifth Chicago International Nature Photography Exhibition in Stanley Field Hall of the Museum just concluded, the Nature Camera Club of Chicago and the Museum as joint sponsors already have plans under way for next year's competition and exhibit.

'PLEASE FORGIVE ME'
By Isabelle de P. Hunt, Philadelphia. Honorable mention.

'TRIO—PERUVIAN LILY'
By Grace Ballentine, Upper Montclair, New Jersey. Winner of first-prize silver medal.

'HUMMINGBIRD MOTHER AND CHILD'
By Arthur E. Anderson, Chesterton, Indiana. Honorable mention.

'ALBERTA BADLANDS'
By Alfred Blyth, Edmonton, Alberta, Canada. Honorable mention.

In the 1950 show, held February 1 to 28, there were shown 189 prints and 601 color slides sumitted by 623 contestants in all parts of the United States and 12 foreign countries. One of the silver-medal winners and several of the honorable-mention entries are reproduced in this BULLETIN.

The total number of entries in this year's event was 2,537 pictures. This is the largest number since the series of exhibits was begun in 1946. Of the total, 2,096 were color slides and 441 were black-and-white large-size prints and a few color prints. The number of persons submitting entries was 623; the entries accepted for exhibition represented the work of 421 of these persons.

Following are lists of medal winners and awards of honorable mention:

MEDAL WINNERS

Black-and-White Photographs:

ANIMAL LIFE SECTION: H. Lou Gibson, Rochester, N.Y.—*Cecropia Female.*

PLANT LIFE SECTION: Grace Ballentine, Upper Montclair, N.J.—*Trio—Peruvian Lily.*

GENERAL SECTION: Clifford E. Matteson, Buffalo—*Winter Magic.*

Color Slides:

ANIMAL LIFE SECTION: Mrs. Lorena Medbery, Armington, Ill.—*Pinch Bugs.*

PLANT LIFE SECTION: Rev. H. Bielenberg, Oil City, Pa.—*Bittersweet.*

GENERAL SECTION: Warren Syverud, Rochester, N.Y.—*Finger Lake Autumn.*

HONORABLE MENTIONS

Black-and-White Photographs:

ANIMAL LIFE SECTION: Alfred Blyth, Edmonton, Alberta, Canada; Arthur E. Anderson, Chesterton, Ind.; Lionel E. Day, Westcliff-on-Sea, Essex, England; H. J. Ensenberger, Bloomington, Ill.; H. Lou Gibson, Rochester, N.Y.; Ben Hallberg, Brookfield, Ill.; Edwin J. Howard, Oxford, O.; Isabelle de P. Hunt, Philadelphia; Clifford E. Matteson, Buffalo; G. Ronald Pryor, Sheffield, England; Louis Quitt, Buffalo; Roy Wolfe, Portland, Ore.

PLANT LIFE SECTION: Blanche H. Adams, Phoenix; Grace Ballentine, Upper Montclair, N.J.; Innocente Braga, Monza, Italy; Howard E. Foote, New York; Frank E. Fuller, Bloomington, Ill.; H. Lou Gibson, Rochester, N.Y.; Betty Parker Henderson, Chicago; Charles Neidorf, New York; Harry R. Reich, North Tonawanda, N.Y.; Ruth Sage, Buffalo; George M. Bushman, Chicago.

GENERAL SECTION: John Anderson, Chicago; Lorne D. Beggs, Chicago; H. S. Burnside, Berwyn, Ill.; Alfred Blyth, Edmonton, Alberta, Canada; Mary M. Fisher, Denver; C. L. Herold, Houston; Betty Parker Henderson, Chicago; Cora Ann Gruner, Chicago; Louise Broman Janson, Chicago; Walter L. Leach, Chicago; Roy E. Lindahl, Drayton Plains, Mich.; Carl Mansfield, Bloomingdale, O.; C. C. Ruchhoft, Cincinnati; T. H. Schuelke, Liverpool, N.Y.

Color Slides:

ANIMAL LIFE SECTION: Edward A. Hill, Fleetwood, Pa.; Clifford E. Matteson, Buffalo; L. D. Hiett, Toledo; Pearl E. Schwartz, Chicago; Rev. H. Bielenberg, Oil City, Pa.; Arthur W. Papke, Western Springs, Ill.; J. F. Madaen, Berkeley; Al Suter, Chicago; Gordon Pearsall, Honolulu, Hawaii; Bertha Townsend, Johnatown, Pa.; Herbert P. Burtch, Chicago; Barbara F. Palser, Chicago; Harry R. Reich, North Tonawanda, N.Y.; Cyril F. Smith, Dartmouth, Nova Scotia; Alfred Renfro, Bellevue, Wash.; Louis Quitt, Buffalo; A. Frank Purcell, Glendale, Calif.; Roland G. Aughinbaugh, Beverly Hills, Calif.

PLANT LIFE SECTION: Lowell Miller, Rochester, N.Y.; Winifred G. Stewart, San Geronimo, Calif.; Bruce R. Davis, Salt Lake City; Cyril F. Smith, Dartmouth, Nova Scotia; C. S. Farr, Freeport, Ill.; Louis Quitt, Buffalo; Ruth F. Sage, Buffalo; Hans Bothe, Riverside, Calif.; Dr. J. F. Burgess, Montreal, Canada; Agnes M. Holst, Pittsburgh; Howard A. Wolf, Chicago; A. T. Guard, West Lafayette, Ind.; Dr. J. L. Schott, Sioux City, Iowa; Blanche H. Adams, Phoenix; Herman Postlethwait, Washington, D.C.; A. Stewart, Santa Barbara, Calif.; Raymond F. Ahern, Los Angeles; F. R. Bittman, Jamaica, N.Y.; Duis D. Bolinger, Corvallis, Ore.; Ladislaus Cutak, St. Louis; Dr. Frank E. Rice, Chicago; Harry A. Sickels, San Francisco; R. Donald Sinish, Fort Wayne, Ind.; Constance M. Cole, Gardena, Calif.; Gordon Pearsall, Honolulu, Hawaii; Clarence D. Cook, Lakeside, Mich.; Helen B. Johnson, Brunswick, Maine; D. L. Rigden, Oakland, Calif.; I. W. Smith, Toronto, Canada; JoAnna B. Holloway, Los Angeles; J. L. Hill, Jr., Rochester, N.Y.; Perry Reynolds, Detroit; Clifford E. Matteson, Buffalo; Frank Proctor, Phoenix; L. C. Harvey, Byron, Ontario, Canada; Albert N. Brown, Chicago; Helen C. Manzer, New York; Everett W. Saggus, Elberton, Ga.; Gladys Diesing, Long Beach, Calif.

GENERAL SECTION: Florence Arquin, Chicago; Odessa H. Barrett, Salt Lake City; Earl R. Belnap, Holladay, Utah; Jack Brennan, Salt Lake City; Clarence D. Cook, Lakeside, Mich.; E. L. Ergenhright, North Hollywood, Calif.; Merle S. Ewell, Los Angeles; Paul W. Headley, Salt Lake City; W. J. James, Chicago; J. G. Kincinas, Chicago; James L. Kirkland, Chicago; W. Scott Lewis, Los Angeles; Arthur E. Lowenthal, Rochester, N.Y.; Raymond A. Matz, Chicago; Nelson Merrifield, Port Arthur, Canada; Edwin C. Minteer, Chicago; A. A. Pennock, Littleton, N. H.; W. W. Ratcliffe, Orem, Utah; Perry Reynolds, Detroit; Ethel Schroeder, Chicago; Lloyd Small, Port Arthur, Canada; Dr. S. Wayne Smith, Salt Lake City; R. W. Soper, Port Arthur, Canada; Harry L. Standley, Colorado Springs; George F. Steck, Oil City, Pa.; Julius Wolf, Chicago.

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BULLETIN

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Lake Shore Drive, Chicago 5

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Members are requested to inform the Museum promptly of changes of address.

PAUL J. WARNER, 1881-1950

In the death of Paul J. Warner, Preparator, the members of the Department of Anthropology have suffered the loss of an invaluable worker and a friend. His knowledge of the collections was prodigious. In addition, his feeling for craftsmanship and his knowledge of the ways in which an Indian would fashion and use his tools were integral parts of his expert mending and reconstruction of Indian specimens. In Hall 4, Indian America, may be seen numerous exhibits showing prehistoric knife blades and spear points on which he constructed handles and shafts.

PAUL J. WARNER

Mr. Warner was born in 1881 in New York City. He was brought to Chicago in childhood, and, as an 11-year-old boy, he haunted the Indian-village exhibits at the 1893 World's Columbian Exposition. His lifelong interest in the American Indian stemmed from that experience.

This interest later led him to live on the reservations of the Iroquois, Osage, Pawnee, Chippewa, Winnebago, and Menominee. In addition, he visited all of the reservations in the United States except those along the West Coast. During this time he became familiar with the whole cultural pattern of many tribes, and he acquired a rare and practical knowledge of Indian materials. He even learned to think like an Indian. His personal qualities of quiet dignity, friendliness, sense of humor, and absolute integrity were the basis of an unusually "solid" relationship with the Indians.

After he came to work for the Museum in 1937, his knowledge of materials from all over the world grew from week to week. He acquired an appreciative recognition of the cultural pattern and craftsmanship of the peoples of such diversified areas as China, the Pacific Islands, South America, and Africa. All members of the Department had the highest respect for his judgment concerning the quality of material, the workmanship, and the intrinsic value of all sorts of specimens.

The loss of Mr. Warner, both as an individual and as a worker who was well worthy of his hire, will continue to be felt deeply by the members of the Department.

AGNES MCNARY

Secretary, Department of Anthropology

Museum Entomologist Wins Navy Citation

Harry Hoogstraal, Field Associate in Zoology on the Museum staff, at present in Africa with United States Medical Research Unit No. 3, has received a citation from the Secretary of the Navy for "exceptionally meritorious services as a civilian consultant in Mammalogy and Entomology with the U. S. Naval Medical Science Group of the University of California's Archaeological Expedition in Africa from 15 January 1948 to 8 December 1948.... For his inordinate patience and expertness in the handling of 100 elephant shrews, he is especially commended for having succeeded in the domestication of these animals for the first time. Among the parasites of animals which his group discovered there are a number of new species with great promise for future laboratory study. Primarily responsible for the collection of a large number of insects, mites, and ticks of medical importance and of a fine series of small mammals which act as the reservoir hosts of human disease, Mr. Hoogstraal's zeal and untiring efforts were in a high degree responsible for the unexcelled achievement of the Naval Medical Science Group."

Botany Project in Europe

In April, Dr. Francis Drouet, Curator of Cryptogamic Botany, plans to leave for Europe to study original specimens of some 1,200 species of single- and few-celled algae on file in the larger herbaria there. Studies are expected to be made in several museums in England, France, Switzerland, Austria, Italy, Germany, Holland, Denmark, Norway, and Sweden. While in Stockholm, Dr. Drouet will represent the Museum at the Seventh International Botanical Congress to be held from July 12 to 20. He plans to return to the Museum early in August. This project has been made possible through the generosity of Elmer J. Richards, of Chicago.

THIS MONTH'S COVER

The spring scene on our cover is one that may be found in the countryside close to Chicago. It is also a miniature diorama compressed within the 24" x 22" x 7" dimensions of an N. W. Harris Public School Extension traveling natural-history exhibit, some 1,100 of which are circulated to all the schools of Chicago by the Museum. The rue anemones in the foreground begin to bloom in the Chicago area about the second week in April and continue until the second week in May. This wild flower is common all the way from New England to Minnesota to Florida.

Peruvian Scientist Here

Javier Ortiz de la Puente, zoologist at the Museo de Historia Natural "Javier Prado," Lima, Peru, is spending two months in Chicago studying this Museum's collection of Peruvian mammals and birds.

NEW MEMBERS

The following persons became Museum Members between Feb. 14 and March 15:

Associate Members

Dr. Joseph A. Davis

Annual Members

C. R. Barker, Peter Bartoli, David Becker, Carl Burnap, Mrs. C. Casella, Gates W. Clancy, Dr. George M. Cummins, Jr., Percy W. Cump, Jr., J. I. DeLong, Mrs. Thomas Deuell, Miss Millian Dieckmann, Neal V. Diller, W. M. Dillon, John M. Drummond, Frank Flick, J. L. Friedman, Paul Gendel, Paul Gibson, Hayden A. Glatte, Mrs. Arthur Gordon, Edward Gordon, Leonard Gordon, Mrs. Harriet W. Grace, Dr. Charles M. Hausman, W. T. Herbert, Charles M. Hines, Charles R. Hodgman, Jr., Mrs. Charles E. Humm, Lambert Kampen, Harold L. Klagstad, Charles L. Leindecker, John G. Leiner, Sigmund W. Lewendowski, Charles P. Lind, Roy O. Meadors, John P. McCollum, Chester M. Miller, Fred H. Nesbitt, J. Louis Plocek, Willard L. Pollard, Dr. Robert F. Purinton, Walter E. Rogan, Master John Sanfilippo, C. E. Shreve, Henry E. Staffel, Dr. Joseph Stagman, Nathan Stagman, John Stamford, George A. Stevens, Leon Stolz, G. Truman Thomas, J. J. Topolinski, William W. Whitnell, Arthur E. Wilk, Edward H. Yoners, Jr., Ores E. Zehr.

BONANZA IN BIRDS: 17,000 SPECIMENS FROM EAST AFRICA

By AUSTIN L. RAND
CURATOR OF BIRDS

The arrival of the van Someren bird collection at Chicago Natural History Museum is an important event in the history of the Division of Birds. This new collection, numbering about 17,000 specimens—study skins of birds—comes mostly from Kenya Colony and Uganda in eastern Africa and is a remarkably complete representation of the known avifauna. Rare as well as common species are present in series, and there are the historically important type specimens on which the original descriptions of at least 37 kinds of birds have been based.

The collection was brought together by Dr. V. G. L. van Someren, who during a period of more than forty years has studied the natural history of East Africa. Dr. van Someren was born in Melbourne, Australia, in 1886. He was graduated in medicine and dental surgery from the University of Edinburgh and, in 1911, was appointed medical officer in British East Africa (now called Kenya).

But even before his appointment to Kenya he was interested in African birds. In 1906 Dr. van Someren and his brother R. A. L. van Someren started a collection of Uganda birds. The first small collection of 2,000 birds was reported on in *The Ibis* for April, 1916, and most of that collection went to the Edinburgh Natural History Museum. It was not until Dr. van Someren's appointment to British East Africa that he was able to undertake an active part in the field work. Then, realizing the complexity of the distribution and variation of birds in the varied terrain of East Africa, he made plans for a thorough survey of Kenya and Uganda.

COVERS VAST AREA

With the help of trained native personnel and the co-operation of administrative officers he was able to gather material from the great area extending from the Ethiopian border and the Juba River south to the Tanganyika border and from the Indian Ocean west over the greater part of Uganda.

About three decades ago, with a collection of 15,000 specimens, Dr. van Someren went to England, and at Lord Rothschild's private museum in Tring he studied his material and prepared a report on it. This was published in *Novitates Zoologicae* in 1922. Some 6,500 of the specimens he deposited in the Tring Museum (which went to the American Museum of Natural History in New York with the rest of the Rothschild collection), including all the types then in it. The rest of the collection he took back to East Africa with him.

Since then the collection has been added to not only through van Someren's own efforts, but his son, G. R. C. van Someren, also made a notable addition from western Ruwenzori; C. W. Benson, another from Ethiopia; and J. P. Benson, another from Meru, Mount Kenya. More new birds were described from the collection, and specimens representing new records for Kenya and Uganda were accumulated.

The getting together of this large collection of bird skins for systematic study was only part of Dr. van Someren's scientific work. The study of mammals, birds, entomology, and botany he considered inseparable, and the ecology and the distribution of the birds and their lives at their nests (he made a collection of more than 5,000 bird photographs from blinds) all received attention. The breadth of his

DR. V.G.L. van SOMEREN

Photograph taken on safari in eastern Africa where he has spent some 40 years studying birds, mammals, entomology, botany, and topography.

interests is indicated by the fact that he is a Fellow of the Linnean Society of London, a Fellow of the Royal Entomological Society, and a member of the British Ornithologists' Union. He was also Honorary Curator of the Natural History Museum at Nairobi (1914–38) and Director of the Coryndon Memorial Museum, Nairobi (1938–40).

His was the rare opportunity to live where he could discover the problems in taxonomy and gather material to solve them. And this is reflected in the collection. By 1949 the collection numbered some 17,000 specimens. More species and subspecies had been described from it so that there are at least 37 type specimens in it, and it is this collection that Chicago Natural History Museum has acquired.

Though the collection was lent for some years to the Coryndon Museum, Nairobi, it has always been van Someren's private collection and since 1940 has been housed in van Someren's residence in Ngong, a suburb of Nairobi Its new home is to be in the study collections on the third and fourth floors of Chicago Natural History Museum in the bird ranges.

Arranged in systematic series, from the most primitive birds, such as the ostriches, penguins, and albatrosses, to the most advanced birds, such as the tanagers and sparrows, the specimens are laid in rows on paper-lined trays, and the trays are filed in dust- and insect-proof steel cases. Each species has its one special place in the

(*Continued on page 8, column 1*)

A MAJOR EVENT IN THE DIVISION OF BIRDS

All hands were called out to help in unpacking the vast van Someren collection of 17,000 birds from eastern Africa. There was not room in the bird range; so the shipment was uncrated in the paint shop.

TREE DAMAGE BY ICE COSTS MILLIONS

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

Winter in north-temperate parts of the United States takes a toll of many plants, especially trees and shrubs. Injury is caused in different ways. Temperatures below freezing kill outright many of the more tender types of plants, particularly those not native to northern latitudes.

If high winds prevail while the ground is frozen and temperature during the day is much higher than that of the preceding night, "burning" of foliage of many evergreen trees and shrubs may take place. For this reason evergreens should be protected by windbreaks, cut evergreen branches, or temporary shelters of cloth, gunnysack, or the like. Further, such plants should go into the winter with their root systems thoroughly moistened so that the leaves may receive proper nourishment and moisture to tide them through adverse drying conditions induced by high winds and high temperatures before the ground has become frozen. The result of excessive loss of water from the leaves, while the ground is still frozen and the roots are inactive, is a "browning" of evergreen foliage on the sun or air-exposed sides that is frequently observed in pines, junipers, yews, rhododendrons, mountain laurels, hollies, and other evergreens.

Heavy snows may weigh down branches of a number of woody plants and split them. Fungus, insect attacks, and various diseases may weaken or kill parts of the woody stem, causing decay, which eventually opens weak areas that become susceptible to winter attacks. While the winter months normally damage and kill many plants, the result is often not apparent until the following spring, particularly in the case of the winter "burning" or "browning."

ICE STORMS' TOLL

Most spectacular is the damage caused within a relatively short time by ice and heavy sleet storms. The load of ice clinging to all parts of the branches of woody plants, especially trees, adds an extra burden, often too great to be sustained. Eventually the branches snap and break off. When such ice storms occur, they usually come and go with such rapidity that within the short span of a day one may witness a striking change in the landscape.

On January 1, 1948, an ice storm occurred around Chicago and suburbs that devastated trees, broke telephone poles, and snapped telephone and telegraph wires, thereby endangering many buildings. This year Chicago and its vicinity suffered great losses brought on by a similar damaging ice storm in the middle of February. The effects were sad to behold. The majority of elms carefully planted along Lake Shore Drive were broken in one way or another. Throughout the city parks and in many other areas branches and large limbs were snapped or broken off under the strain of the ice. Losses in plantings amounted to millions of dollars.

Here are a few observations made during and after the last storm as to type of tree damaged, location in which the tree grew, and relation between the tree's habit of growth and its resistance to breakage. First, it was noted the storm took its heaviest and most conspicuous toll of American elm and soft or silver maple trees.

ELMS' WEAK POINT

It is easy to understand why the American elm should fall prey so readily to ice damage. The trunk of this elm forks above the middle into two main parts. These forks, with their

PARK CASUALTY
Damage to an American elm during February ice storm in Chicago.

subsequent growth giving rise to new twigs and branches developing in the direction of the two forks, are responsible for the ultimate fan-shaped or Y-shaped form of the tree, which gives it its stately and beautiful shape. Unfortunately, when these main forks and their subsidiary branches are weighted down with a heavy coat of ice, the strain sooner or later results in snapping off either or both of the forks above the main trunk. The trunk stands but the forks "give," much like the two prongs of the "wishbone" of a chicken when pulled. Thus the very growth-habit that makes the elm so attractive often spells its death in time of ice storms.

Soft or silver maples (*Acer saccharinum*) also are easily damaged by ice storms. So are brittle twigs of peach trees, linden, poplar, box-elder, and the like. On the other hand, tough sturdy oaks or hickories rarely succumb to ice damage. In contrast to the soft maples, the sugar and Norway maple of the hard maple group have tough wood and strong lateral branches that seldom if ever break. The sycamore, too, bears strong side branches.

The location of the tree often plays an important role during a severe ice storm. Thus the American elms adjacent to the lake, being most exposed to wind, received the full force of the wintry blast. They were damaged more severely than many other American elms growing in more protected sites in the city or in natural forests. In the forest preserves and in natural forested areas where the trees protect one another, they suffered much less damage.

RESISTANCE FACTORS

But what enables plants to resist adverse conditions? Although not all answers to this question are known, some comments regarding the internal composition of woody stems are of interest here.

Naturally, without proper anchorage insured by a strong root system a tree or shrub would be unable to stand up. Equally important is the structure of the tree that we see above the ground. The woody part of the tree consists of an outer covering, the bark, enveloping various tissues made up of billions of tiny cells that provide either mechanical support, function in the conduction of water and conduction and storage of manufactured food, or cause increase in the size of the tree by growth in length and thickness.

The two major tissues of the wood are the *xylem*, concerned mainly with mechanical support, and the *phloem*, concerned mainly with the conduction of manufactured food. The pith, which in soft-stemmed herbaceous plants, like corn, makes up the spongy central core of the stem, in older woody stems of trees dries up, collapses, and is replaced by tougher more resistant cells with firmer walls for support. The cells of the phloem and xylem of trees contain various types of reinforcements and strengthening elements. Otherwise they would not be able to withstand strains and weights and the adversities of the weather to which they are subjected daily. Therefore we find such cells as *phloem fibers*, with very long and thick-walled cells, which serve as mechanical protection to the more weakly constructed but highly essential cells known as *sieve tubes*, the function of which is to transport foods from one part of the plant to another for storage or consumption.

Then, in the xylem or *true wood* of the tree are also found cells that provide rigidity and strength and at the same time function in a conductive capacity. These are known as tracheids and are of two kinds: (1) *wood fibers*, which are heavy-walled, long cells with almost no cavity but with a high degree of mechanical strength, and (2) *vessels* or *tracheal cells*, which are much shorter cells with rather thin walls and wide cavities, having the important function of carrying ascending water in the stem.

Moreover, other cells, elongated at right angles to the axis of the woody stem, are scattered among the woody cells in horizontal bands or ribbons running through the xylem like spokes of a wheel. These are known as *wood rays* and facilitate the horizontal transfer of materials in the stem or act as centers of food storage. Other types of cells are provided with spiral thickenings or bands to furnish more elasticity for the bending and swaying daily exacted by winds on the aerial parts of a tree.

AN INTRICATE SYSTEM

The different cells in a woody stem are thus adapted in a variety of ways to the welfare of the tree to offer it mechanical support, elasticity, and flexibility. As the sap wood changes to heart wood, the cell walls of the heart wood become impregnated with tannin, resins, and other substances and the heart wood increases in hardness, thereby aiding the mechanical strength of the trunk. The heart wood also possesses, by means of these added chemicals in its cell walls, certain toxic properties that help keep the tree strong by preventing disintegration of the wood. Light woods possess more cell-cavity space than heavy woods and can be more easily entered by destructive fungus plants.

Although these woody elements are found in all woody plants, no two woody plants are alike. Actually trees can be identified by their internal wood structure, so intimately connected with their habits and growth. The very fact that the many species of native trees in the Chicago region have survived for thousands of years following the withdrawal of the last ice sheet is proof of their ability to survive. However, much remains to be learned regarding each species of tree and its particular relation of resistance to breaking by winds and ice.

WYOMING 'MUMMY' MYSTERY SOLVED

The mystery surrounding a so-called "dwarf mummy" found in a cave near Casper, Wyoming, was dispelled by investigations made by members of the scientific staff of this Museum last month. The specimen had had wide publicity in the newspapers and on the radio as a supposed representative of a hitherto unknown prehistoric race of men and was thought to be adult despite its stature of only 14 inches. It was brought to the Museum for study by its owner, Iva P. Goodman, of Casper, and Ray Henle, a commentator for the National Broadcasting Company.

The study was conducted by Dr. Rainer Zangerl, Curator of Fossil Reptiles, and D. Dwight Davis, Curator of Vertebrate Anatomy, who issued the following statement (with which Dr. Paul S. Martin, Chief Curator of Anthropology, concurred):

"X-ray photographs made at Chicago Natural History Museum reveal that the 14-inch dwarf 'mummy' said to have been unearthed in 1934 from a sealed granite cave near Casper, Wyoming, is the dried body of a human infant. The child was an anencephalus monster, the commonest of all congenital malformations in man. In anencephaly the brain and brain-case fail to develop, and such monsters rarely live for more than a few minutes after birth. The deformation gives a hideously nonhuman appearance to the head and neck, but the rest of the body is usually quite normal.

"The X-rays show conclusively that the supposed 'dwarf' cannot be an adult. The development of the bones is exactly like that of a child at birth. Photos of anencephalic monsters can be seen in any textbook on the use of X-rays in embryology and obstetrics.

"The 'mummy' is not a real mummy, but merely a dried body of an infant probably buried not more than 25 years. Suggestions that it is the body of a miniature prehistoric man are fantastic. It might have been a 'skeleton' from someone's family closet, surreptitiously deposited in the cave in which it was discovered. Because of its shriveled condition, it is impossible to tell whether the infant was an Indian or a white man."

PALEONTOLOGY EXPEDITION BEGINS TEXAS WORK

The Texas Paleontological Expedition will leave Chicago April 1. Bryan Patterson, Curator of Fossil Mammals, and Dr. Rainer Zangerl, Curator of Fossil Reptiles, plan to work in a large area surrounding the cities of Dallas and Fort Worth, located in the northern part of the eastern Cretaceous belt of Texas. The expedition has two main objectives: (1) a careful investigation of the Early Cretaceous Trinity Sands in Montague County, where a reconnaisance party of the Museum discovered mammalian and frog remains last autumn, and (2) to search for similar deposits south of Montague County and for Late Cretaceous vertebrates mainly in the Eagle Ford Shale and the Taylor Marl (very few vertebrate localities are known in the latter formations). Investigation of the Late Cretaceous deposits in Texas presents a continuation of our program of faunal study of the southern so-called Gulf Series of deposits of late Cretaceous age.

Technical Publication Issued

The following technical publication was issued by Chicago Natural History Museum last month:

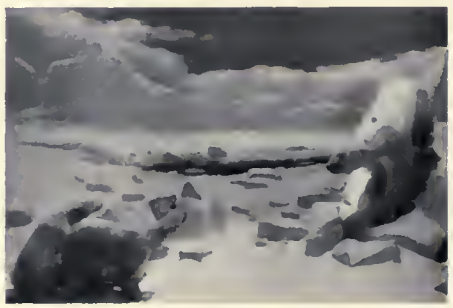
Fieldiana: Zoology Memoirs, Vol. 1. *Siphonaptera from Central America and Mexico.* By Robert Traub. February 28, 1950. 127 pages, 54 zinc plates. $4.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The Museum's original habitat group of the polar bear was mounted for a four-sided case by the late Carl Akeley in 1900. The reinstallation of the group with a painted background necessitated a completely new plan. The present group is in Richard T. Crane, Jr., Hall (American Mammals—Hall 16).

The original group of polar bears in 1900



The present habitat group of polar bears in Hall 16

* * *

"The work of collecting fossil dinosaurs was continued during the summer by an expedition made to Colorado by Assistant Curator Riggs and Preparator Menke.... One leg bone found, probably a humerus, was 6 feet 10 inches in length, exceeding by several inches any such bone ever found before and giving proof of the existence of an animal of the dinosaur type larger than was ever before described."

Last of Audubon Lectures April 16

The fifth and final lecture in the current series of the Illinois Audubon Society will be given Sunday afternoon, April 16, at 2:30 o'clock in the James Simpson Theatre of the Museum. The lecture, "The Riddle of Migration," will be presented by Roger Tory Peterson, of New York, artist, scientist, and author of widely used field-guides to bird identification.

No Easter Rabbit . . .

THE AFRICAN 'BUGS BUNNY,' A PICARESQUE CHARACTER

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

UNDER the title of Bugs Bunny or Bugsy, the adventures of Hare are known to millions of American children and his exploits are appreciated in comic strips and on the screen. The American cartoon character is closely related to an

African folklore prototype. To be sure, he is a rascal and full of guile—this may be said of either the American or African character. But withal he is a likable villain, the Kingfish of the animal world, a schemer who outwits in turn the courageous lion and the noble elephant. Occasionally, however, he overreaches himself. He is too smart and underrates the intelligence of his victim. Then the children hold their breath—surely he will be killed this time! No, his cunning and resource have again set him free and he bounds across country to the shelter of his "form," which is often a deep hole at the root of a tree. We have to be careful with respect to the African Hare not to say his "hurrow"; neither must we call him a rabbit. There are no rabbits in Africa, but hares are widely distributed.

Although Hare is a deceiver and a delinquent he can boast a lineage stretching back over the centuries. The humor of his antics while running and fighting was the joy of Negro children in Africa long before the arrival of Europeans, and age-old folklore stories of the cunning of Hare were perhaps the sole consolation of miserable slaves on the dreary voyages from West Africa to America. Negro culture survived in the West Indies, the southern states, Brazil, and particularly in Dutch Guiana. There the jungle sheltered many Negro refugee slaves, and today these colonies remain as small islands of African race and culture now thousands of miles from their place of origin. Religion, magic, arts and handicrafts, mythology and folklore are still welded into a cultural pattern. Incidentally, Hare of African origin, sometimes in disguise of a rabbit, is the hero (or villain) of many American Negro tales.

Very few attempts have been made by African Negroes to invent a script for writing their songs, tribal history, riddles, and folklore. But memories are good, and Negro languages are rich in vocabulary and metaphor; therefore the tales are passed verbally from one generation to another.

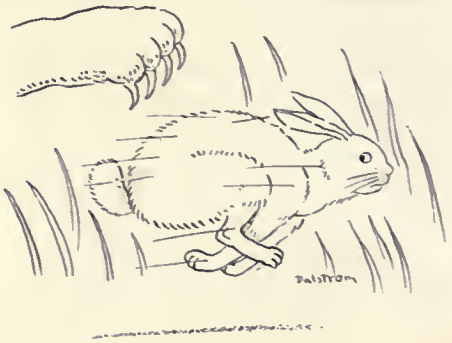
We who are accustomed to so many pleasures and amusements perhaps find difficulty in understanding why so much satisfaction is derived from simple narratives. It is true that Negro children, and adults as well, have their singing, dancing, games, and musical instruments, but these do not meet all requirements. In fact, such pastimes are mainly an adjunct to literary expression. Folklore stories are acted with clever mimicry, and the antics of animals are the subject of games in which the creatures are made to think and act like human beings. A few animals, the crocodile, python, and leopard, have been reverenced. The first two have been the focus of a definite worship with attendant priesthood. The leopard has been the emblem of strong organizations of a social and political kind. Almost every animal has a legendary history and most of them have here or there been chosen as totemic creatures, the sacred animals whose names are symbols for the clan. The clansmen must not kill or eat their emblem animal. On the contrary, they should protect it, and, in turn, the creature is thought to protect them.

In Negro tribes a hunter is (or was before European interference) the leading authority on animal life. He spent years of training under an expert, and his livelihood depended on an intimate knowledge of the habits of animals. All boys imitate the activities of hunters, and at an early age are expert with blunt wooden arrows. The stories are told therefore by hunters, by boys who have scoured the hillsides and forests for appetizing morsels of fur and feather, by women who are the most awful chatterboxes while they pound their grain or work in the fields.

Perhaps the popularity of Hare is due to the many facets of his character. We see him, in turn, kind and helpful or no better than a mean sneak-thief. In popular slang he is a "double-crosser" and a "show-off" without parallel in the animal world. In the story of his friendship with a cow and her calf, who are threatened daily by a lion, Hare figures as a protector of the weak. He hides in a cave with them, receives a small quantity of milk as a reward for discovering this refuge, then hatches a plot to frustrate the lion. Hare takes a little blood from the cow and holds it in a cup behind his back. When the lion appears at the entrance to the cave Hare quickly dashes the blood at him, saying, "Look! you are wounded in the side." The lion, totally lacking his legendary courage, flees the spot. The cow says in congratulation, "I never thought that one so small as Hare could be so kind and brave."

A trickster is sure to make enemies, and Hare gives many a nervous glance around as he leaps along. There is the baboon who owes a grudge and is seeking a settlement. It happened in this way. Hare and the baboon were caught in a patch of flaming grass, but the latter made a quick exit, running as he does on all fours. Hare was so long emerging that the baboon had given up all hope of his survival. But Hare was quite unperturbed and, with a grandiose air, he said, "I see you are out of breath. Never run from the flames. I always just spit at the fire around me and put it out." As a matter of fact, Hare had hidden in a deep hole where he was safe until the fire had swept by. But the baboon was completely deceived. He treasured this fragment of misinformation and, in trying to quench a fire as Hare suggested, nearly lost his life.

The storyteller enjoys best of all the series of tales that leave Hare with apparently no loophole for escape. The narrator is a past master for introducing what modern novelists and writers of detective stories call "the element of suspense." And so we find Hare brought before Justice of Peace Lion. The offender is tried for theft and all kinds of mischief and is condemned to death. The narrator then draws the ashes of the fire together, folds his blanket, and prepares to retire. All this means "to be continued in our next issue," and the listeners are left to speculate just as modern and more sophisticated readers have to guess the fate of their hero. Sadly, Hare makes a last request before his execution. "Just let me dance and sing my favorite song," he pleads. The request is granted. Hare is no mean terpsichorean performer. He selects the most dusty piece of ground and starts a mad whirl. He leaps in the air, flings his legs, and is in a perfect frenzy. Then, leaping from the cloud of dust he has created, he gives a mocking laugh and races to the safety of the bush.



Cartoons by Gustaf Dalstrom

REPORT FROM MICRONESIA

By ALEXANDER SPOEHR
CURATOR OF OCEANIC ETHNOLOGY

In the northwest corner of Micronesia lie the Marianas Islands, discovered by Magellan in 1521 and from time immemorial the home of the Chamorros, as the native people are called. Although most of the islands of Micronesia are coral atolls, the Marianas are all high islands that extend northward from Guam in a long chain.

Since November, 1949, the Museum's Micronesian Anthropological Expedition has been conducting work in the Marianas on a combined ethnological and archaeological project. The ethnological project is concerned with the present-day culture of the Chamorros and the changing trends that their culture exhibits. The Chamorros today live on Guam, Rota, Tinian, Saipan, and Alamagan, a small island in the northern part of the chain, while a group of Caroline Island natives, who migrated to the Marianas in the 19th century, live on Saipan and Agrihan. The work is centered among the approximately 6,000 Chamorros and Carolinians on the islands north of Guam, for these people were formerly under Japanese domination and we know little about their present culture.

In the Micronesian area as a whole, the native peoples present extremes of cultural contrast. In the more remote islands of the Carolines the natives follow the patterns of their life in much the same manner as in olden times, allowing for certain changes brought by missionary and trader. The Chamorros are at the other end of this spectrum of culture contrast. Guam, the principal center of population in the Chamorro world, was an important stopping place for the Spanish galleons making the long voyage from Mexico to the Philippines during the days of Spanish empire in the New World and in the Pacific. The natives intermarried with Spaniards and with Tagalogs brought from the Philippines and were converted to Catholicism by the Spanish padres.

LANGUAGE PRESERVED

Nevertheless, the Chamorro language continues as the language of the peoples of the Marianas, while other cultural survivals remain as testimony of the old life. The Chamorros today are primarily a folk people, primitive in no sense of the word, yet in no way urban sophisticates.

Of all the Micronesian islands, the Marianas probably suffered most during World War II. The houses and possessions of the natives were destroyed, and much of their farm land was rendered unusable by wartime base construction. Today the people are rebuilding their communities and the old cultural patterns are reasserting themselves. Yet the war has wrought marked cultural change, not merely in the landscape but in the lives of the people as well. A primary objective of the expedition's work is to examine this recent cultural change, as seen against the long history of contact with the West and with Japan. The techniques of making a living, the economic organization that guides the work in the fields and the fishing offshore, the life that goes on within the family, the central position of the church among these devout people, and the organization of their political life are all points of interest in the investigation.

A subsidiary problem is offered by the presence of the Carolinian minority among the Chamorros. These people, of a different ethnic background, still maintain a cultural separateness from their Chamorro neighbors. Given more to fishing than to farming, they cling to many of their own customs while staying on equable terms with their fellow islanders, the Chamorros. The Marianas therefore offer to the ethnologist a series of problems in culture contact and change.

PREHISTORY SOUGHT

A second objective of the expedition is aimed at problems lying farther back in the Chamorro past. What was prehistoric Chamorro culture like and where did the Chamorros come from? Spanish accounts contain sufficient information on Chamorro culture at the time of first contact to provide a starting point for archaeological work. Some excavating has been done, mainly on Guam, so that there is a certain amount of knowledge of prehistoric Chamorro life. But no sequence of prehistoric cultures in the Marianas has ever been established by modern archaeological methods. Perhaps none exists, but the problem must be attacked if scientific advance is to be made in the prehistory of this part of the Pacific. Eventually we may be able to relate the prehistoric Chamorro materials to archaeological data from the islands to the southwest, and even to early horizons in the Philippines.

To date, the Museum expedition has completed an archaeological survey of Saipan and a preliminary survey of Tinian. Excavations have also been commenced on Saipan and at a later date will be extended to other islands. The progress of the work will be described in future numbers of the BULLETIN.

The Museum has maintained a long-standing interest in the anthropology of the Pacific area. At the present time, with most of Micronesia under American administration, this interest is of wider importance than to a few scientists alone. Anthropological research that throws light on contemporary cultural change in Micronesia is of practical significance to the administrators who must govern the area. The solving of more academic problems regarding the prehistory of Micronesia contributes to a body of knowledge whose formulation must be primarily the responsibility of American research institutions.

STAFF NOTES

Karl P. Schmidt, Chief Curator of Zoology, will spend three months in Germany at the Senckenberg Museum and the University of Frankfort as a member of the currently organized University of Chicago faculty exchange team. He will leave in mid-April for New York from Rockport, Texas, where he is scheduled to give an address at the spring seminar of the Texas Game, Fish, and Oyster Commission. Mr. Schmidt will engage in studies on amphibians and reptiles in the Senckenberg Museum, where his stay will be an equivalent for the recent work in Chicago Natural History Museum of Dr. Robert Mertens, director of the Senckenberg Museum.... **Dr. Theodor Just,** Chief Curator of Botany, conducted a seminar at Northwestern University on "Divergent Mutation or Selection."... **Dr. Julian A. Steyermark,** Associate Curator of the Herbarium, has been re-elected president of the Barrington Natural History Society.... **Dr. Paul S. Martin,** Chief Curator of Anthropology, **Donald Collier,** Curator of South American Ethnology and Archaeology, and **George I. Quimby,** Curator of Exhibits in Anthropology, represented the Museum at a symposium on evolution held at the University of Chicago. Dr. Martin lectured and showed films of his archaeological expeditions recently before the Adventurers' Club and gave a radio talk over a National Broadcasting Company network on the Museum's solution of a "mummy mystery" (*see page 5*). Mr. Collier participated in the meeting of the Carbon-14 Committee at the Institute for Nuclear Studies at the University of Chicago.... **Dr. John B. Rinaldo,** Assistant in Archaeology, lectured for the Earth Scientists Club of Northern Illinois in Maywood.

Expedition to Cuba

Dr. B. E. Dahlgren, Curator Emeritus of Botany, and Dr. Hugh C. Cutler, Curator of Economic Botany, left March 14 on a botanical expedition to Cuba. They will continue the collecting and research in which they have been engaged on that island for the past several years.

Borneo Expedition Leaves

The Borneo Expedition of the Museum emplaned for its first port-of-call, Singapore, March 19. Co-leaders of the expedition are D. Dwight Davis, Curator of Vertebrate Anatomy, and Robert F. Inger, Assistant Curator of Fishes. After arrival at Sandakan the expedition will add native personnel for the work in the field, which is to take about six months.

5 SATURDAY AFTERNOON LECTURES ON TRAVEL

The annual Spring Course for adults of free illustrated lectures on travel and science will continue throughout April. The five remaining lectures will be presented each Saturday afternoon at 2:30 o'clock in the James Simpson Theatre of the Museum. Motion pictures in color will accompany all of the lectures except one, for which slides will be used.

Limited accommodations make it necessary to restrict these lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lecturers:

April 1—GORILLA HUNT
R. Marlin Perkins

April 8—ALASKA WILDLIFE
Cecil E. Rhode

April 15—TRAVEL TRAILS OF THE ANDES
Herbert Knapp

April 22—ABORIGINAL AUSTRALIA
F. M. Setzler

April 29—AMERICA OUT-OF-DOORS
Victor Coty

Requests for reserved seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the lecture day.

BONANZA IN BIRDS—

(*Continued from page 3*)

biological classification and a corresponding one in our collection. The whole functions as a gigantic, self-indexing filing system, where any specimen can be consulted at any time and filed away again.

The van Someren collection arrived in nine huge cases that came in bond to the Museum. There was not enough room in the bird range to open them and so we put them in the fourth-floor paint shop. There, under the watchful eyes of two United States customs officers, unpacking started. The paint shop hummed with activity. Interest extended far beyond the Division of Birds. Everyone vied for a crowbar, nail-puller, hammer, screw driver, or tin shears. As the lids came off and the protective metal lining was sheared away, the beautifully packed collection began to emerge from the cases. Each specimen had been wrapped in cotton, in paper, or in both. The specimens lay side by side, row upon row, layer upon layer, and had arrived in perfect condition.

We already have considerable African material from earlier expeditions and purchases. Notable additions in recent years include material such as that from Cameroon collected by A. I. Good, from Liberia collected by Harry A. Beatty, and from Kenya donated by Walther Buchen. All will be used together in studies on distribution and variation. A great many species are new to our collections but no species new to science are expected to emerge. However, there remains much to be done in the zoogeography, relationships, and taxonomy of African birds.

PLEASE NOTIFY MUSEUM IF YOU'RE MOVING

Members of the Museum who change residence are urged to notify the Museum so that the BULLETIN and other communications may reach them promptly.

Members going away for extended periods may have Museum matter sent to their temporary addresses.

LECTURE TOURS IN APRIL DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., April 5—Bright Feathers—Bird Survey (*Jane Sharpe*).

Fri., April 7—The Story of Mexico. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., April 12—Spring in the Woodlands—The Earliest Flowers, Leaves, Birds, and Reptiles (*Miriam Wood*).

Fri., April 14—Amoeba to Ape. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., April 19—Giants—Plants and Animals (*Marie Svoboda*).

Fri., April 21—One Man's Meat—Unusual Food-Animals. Illustrated introduction in meeting room (*Harriet Smith*).

Wed., April 26—Stone Age Man (*Lorain Farmer*).

Fri., April 28—Weather Ways—Weather and Climate. Illustrated introduction in meeting room (*Anne Stromquist*).

Persons wishing to participate should apply at North Entrance. Tours are free.

MOVIES FOR CHILDREN SATURDAY MORNINGS

Five more free programs of motion pictures for children will be given on Saturday mornings in April in the James Simpson Theatre of the Museum. They are given under the auspices of the James Nelson and Anna Louise Raymond Foundation. All of the programs begin at 10:30 A.M.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are neeeded.

Following is an outline of the programs:

April 1—ANIMAL LEGENDS
Also a cartoon

April 8—ANCIENT PALESTINE
2,000 years ago

April 15—ARRIVAL OF SPRING
Also a cartoon

April 22—CHINA TODAY
Also a cartoon

April 29—JUNGLE BOOK
Kipling's famous story

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

From: E. D. Merrill, Jamaica Plain, Mass.—a complete specimen of *Cycas Wadei* Merrill, Philippine Islands; Museo Nacional, San José, Costa Rica—366 herbarium specimens, Costa Rica; Universidad del Cuzco, Peru—19 herbarium specimens and 26 ears of maize, Peru; Botanical Museum, Harvard University, Cambridge, Mass.—249 herbarium specimens, Brazil and Colombia; Academy of Natural Sciences, Philadelphia—133 specimens of algae, Mexico.

Department of Zoology:

From: Alex K. Wyatt, Chicago—a caddice-fly and 16 specimens of flies, bees, wasps, and grasshoppers, Illinois and Indiana; Dr. Henry Van der Schalie, Ann Arbor, Mich.—27 specimens of fresh-water mussels, Kansas; Eugene Ray, Chicago—40 beetles and a beetle paratype, Cuba and the United States; Javier Ortiz de la Puente, Museo "Javier Prado," Lima, Peru—a lizard and a frog, Ecuador; William G. Hassler, Nashville, Tenn.—a salamander, Tennessee; W. E. Eigsti, Hastings Museum, Hastings, Neb.—38 specimens of ecto-parasitic insects, Nebraska; Gordon Thurow, Chicago—8 lizards, Bermuda; Merle L. Kuns, Lafayette, Ind.—a bat skull, Mexico.

Library:

From: Col. Clifford C. Gregg, Valparaiso, Ind.; Dr. Henry Field, Washington, D.C.; Art Institute of Chicago; Alex K. Wyatt, Chicago; Mayuyama and Co., Tokyo.

If your Museum visit extends over several hours, there is a cafeteria to serve you.

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BULLETIN

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Lake Shore Drive, Chicago 5

TELEPHONE: WABASH 2-9410

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Members are requested to inform the Museum promptly of changes of address.

A 'SECOND RETIREMENT'

Mrs. Emily M. Wilcoxson, former Librarian of the Museum, so loved her work and was so devoted to the Museum that when an opportunity for official retirement came on June 30, 1946, she eagerly accepted an invitation to remain for several more years as Librarian Emerita. On March 31 of this year she made a "second retirement," leaving the Museum for a long-due and well-earned rest at the home of her stepdaughter, Mrs. Frank S. (Mary W.) Baker, in Lombard, Illinois (Mrs. Baker, formerly employed at the Museum as Associate Librarian, retired in 1949). In all, Mrs. Wilcoxson faithfully served the Museum for almost forty-five years. She first joined the staff on August 1, 1905, as Assistant Librarian. On July 1, 1930, she was appointed Librarian, filling the vacancy left by the retirement of the late Miss Elsie Lippincott.

MRS. EMILY M. WILCOXSON

During the years of Mrs. Wilcoxson's custodianship the Library of the Museum underwent great expansion, both in the growth of the collections of books and pamphlets on its shelves and in service to the staff of the Museum, other scientists, and the general public. In this same period the physical quarters of the Library were enlarged, refitted, and rearranged in order to improve the facilities. In the period of her post-retirement services to the Museum as Librarian Emerita, Mrs. Wilcoxson devoted herself to certain special projects of indexing and of completing bibliographies.

Mrs. Wilcoxson's career in the Museum was marked by a spirit of extreme friendliness and kindliness, which endeared her to all members of the Museum staff and others using the Library. She set standards for service that are regarded as guides for the present Library staff. The administration and personnel of the Museum join in the hope that Mrs. Wilcoxson may now find her retirement one of many fruitful and enjoyable years.

STAFF NOTES

Colonel Clifford C. Gregg, Director of the Museum, recently spoke before the Chicago Junior Chamber of Commerce on "Chicago Natural History Museum and Its Services to the Public."... **Dr. Julian A. Steyermark,** Associate Curator of the Herbarium, spoke in Barrington before the League of Women Voters on "Conservation of Natural Resources."... **Donald Collier,** Curator of South American Ethnology and Archaeology, presented a paper on "The Present Status of Carbon-14 Dating" at a symposium on "Techniques in Archaeology" sponsored by the Viking Fund, Inc., in New York. Curator Collier will attend the annual meeting of the Committee on Anthropology and Psychology of the National Research Council in Washington, D.C., May 12–13. He has been appointed a member of the Executive Committee of the anthropological body, to serve for one year from July 1 .... **George I. Quimby,** Curator of Exhibits in Anthropology, will attend the meetings, May 19–20, of the Society for American Archaeology and the Central States Branch of the American Anthropological Association. The meetings will be held at the University of Oklahoma in Norman. Curator Quimby is secretary of the first organization and president of the second.

County School Prize Winners Entertained at Museum

On April 3 the Museum was host to some 380 boys and girls selected as the best pupils in the Cook County public grade-school system. They met in the James Simpson Theatre of the Museum, where County Superintendent of Schools Edward B. Simons presented them with badges of membership in the Cook County Achievement Club.

THIS MONTH'S COVER

Each year thousands of people visit lakes and some spend considerable time enjoying their quiet beauty as well as swimming, boating, or fishing along the edges of their plant beds. But few people ever really see the part of the lake under water, a three-dimensional world of aquatic plants and animals. Such a scene as it appears viewed through a diving helmet is shown in a Museum habitat group at the entrance to the Hall of Fishes (Hall O), part of which is reproduced on our cover. It is typical of the Michigan, Wisconsin, Illinois, and Indiana lakes frequented by residents of the Chicago region. The fishes are the work of Leon L. Pray, former Staff Taxidermist. Background and installation are by the late Arthur G. Rueckert, former Staff Artist, and W. E. Eigsti, former Staff Taxidermist.

On page 4 of this BULLETIN is an article on hearing in fishes.

Photographers Visit Museum

During the Chicago convention of the Photographic Society of America in April, a group of delegates made a "field trip," with picture-taking equipment, to Chicago Natural History Museum.

NEW MEMBERS

The following persons became Museum Members between March 16 and April 14:

Associate Members

Maurice S. Firsel, Mrs. Howard G. Kornblith, Mrs. Vincent Yager.

Annual Members

R. J. Bennett, Edward P. Brooks, J. Forbes Burns, E. E. Diehl, Dwight S. Dodson, Arnold F. Emch, Erwin G. Fredrick, Dr. Marion Lee Gordon, Milton Gordon, Norman Gordon, Dr. Rex D. Hammond, Louis F. Haynes, Dr. Paul G. Hesse, Edward L. Hilton, Clarence L. Holmberg, Leonard O. Krez, Lewis Layton, Nobel W. Lee, John A. Leith, E. P. Lichty, Benson Littman, James Maurice McCallister, J. E. McWilliams, Oren Elmer Miller, Mrs. E. Harold Mohn, R. E. Nelson, Jr., Leonard B. Nice, Dr. F. M. Nicholson, Gustave Norman, Miss R. Palmerton, James A. Prindiville, Paul C. Raymond, Mrs. Hopewell L. Rogers, Miss Clara A. Scheiner, Edgar Stanton, Jr., Lyman J. Stuart, Lisle W. Sweet, Miss Maria P. Sylvester, S. A. VanDyk, W. Neal Waterstreet, Harold H. Webber, Mrs. Maurice Weigle, Charles S. Winston, Jr., John T. Woodside, Arthur F. Zitzewitz.

EXPLORING MAN'S PAST IN ISLES OF THE SOUTH PACIFIC

By ALEXANDER SPOEHR
CURATOR OF OCEANIC ETHNOLOGY

Centuries ago—just how long no one knows—man first ventured eastward from Asia into the Pacific. In time, all the major islands of the immense Pacific area were peopled by adventurous seafarers, many years before Magellan circumnavigated the globe. One group of these eastward-moving peoples settled in the Marianas Islands, where the Museum's 1949–50 Anthropological Expedition to Micronesia is currently conducting field work.

One phase of the work of the expedition consists of archaeological excavations on Saipan, next to Guam the largest island in the Marianas group. The purpose of the archaeological project is to throw light on the prehistory of man in the Marianas and to piece together the pattern of his ancient culture, at present known only through preliminary and incomplete, though valuable, exploration.

Unfortunately for the archaeologist, the invasion of Saipan during World War II and its subsequent use as a major base for operations against Japan destroyed most of the archaeological sites that once were very numerous on the island. Yet enough remain to make digging profitable. Beginning in February, the Museum commenced an excavation program at four type sites: a small house site, a large house site, a rock shelter, and a shell midden.

REMAINS OF EARLY HOUSES SCANTY

When the Spanish first established themselves on Guam in the 16th century, they described the Chamorros—the name the natives go by—as living in villages of wood-and-thatch houses built on stone pillars. Today all that remains of these houses are the stone pillars or *lattes*, together with massive rice-grinding mortars that are usually to be found near-by. Each pillar consisted of two parts: a rectangular or trapezoidal stone column and a round stone capstone that surmounted the column. On Saipan all the capstones have fallen from the columns, and many of the columns have likewise collapsed, though in undisturbed sites they remain where they have fallen.

The smaller of the two houses that the Museum has excavated proved to have only a shallow culture-bearing stratum of earth around and beneath it. This stratum contained broken pottery, shell adze-blades, shell fish-hooks, and other implements that the inhabitants used. The house site was undoubtedly occupied only once and probably for not more than fifty years. For dating purposes, the most important find was an iron fish-spear point and a fragment of an iron knife blade.

It is recorded that the Spanish were trading iron to the natives for rice as early as 1576. Furthermore, the natives of Saipan were moved to Guam by the Spanish in 1698, after a series of native uprisings. The Chamorros did not return to Saipan until the middle of the 19th century, when they no longer constructed stone-pillared houses. So the small house dates from the 17th or latter part of the 16th century.

CHRONOLOGICAL STUDY

Although the archaeologist enjoys finding earlier remains than this, one of his main jobs is to establish a chronology of prehistoric culture growth and development. In so doing, he generally works from the known recent to the unknown past. So the small *latte* was just what we needed—a starting point for working on a chronology reaching backward into the prehistory of the islands.

The second house was larger and more impressive. Its ten stone pillars, arranged in two parallel rows, covered an area 50 feet long. Four of these pillars had eroded away just above the base and had fallen to the ground, though the bases themselves had remained in place. The house itself was probably not much older than the first one because the pottery was much the same. But beneath the house was four feet of earth containing tools and pottery, evidence that the site had been used by previous dwellers. Located near a beach and fringing reef where the fishing is good, protected from serious storms by an adjacent limestone outcrop, close to fertile land, cool and pleasant, the site must have caught the eye of generations of early inhabitants of Saipan as a desirable place to live.

EXCAVATING PREHISTORIC RUINS ON SAIPAN

Dr. Alexander Spoehr, leader of the Museum's Anthropological Expedition to Micronesia, and an assistant are excavating the fallen pillars of a Chamorro house erected long before the advent of the Spaniards in the Marianas Islands during the 16th century.

Although no burials were found at the first house, they were numerous at the second. The people who lived at the second house buried their dead in pits beneath the house. Curiously enough, and much to the surprise of the digging crew, a number of the skeletons found were without skulls. Whether these individuals lost their heads in head-hunting forays or whether the skulls were removed by the surviving relatives before the bodies were buried we do not know.

The rock shelter proved to be a crematorium and burial ground. The top stratum consisted solely of ashes, in which were

(*Continued on page 8, column 1*)

Visiting Hours Change May 1

Beginning May 1, summer visiting hours, 9 a.m. to 6 p.m., will go into effect until September 4 (Labor Day).

WHAT AND HOW FISHES CAN HEAR, AS REVEALED IN TESTS

By ROBERT F. INGER
ASSISTANT CURATOR, DIVISION OF FISHES

Before the turn of the last century most biologists did not believe that fishes could hear. The reasons for this disbelief were both theoretical and experimental. In the first place, the inner ear of fishes (*Fig. 1*) is not equipped with a cochlea—the snail-shaped seat of hearing of the higher vertebrates (*Fig. 2*)—nor a basilar membrane,

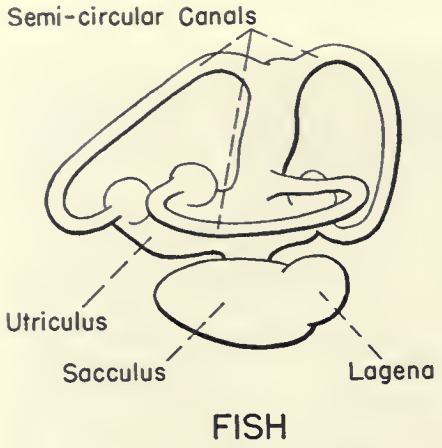

Fig. 1. The inner ear of a bony fish.

the part of the cochlea bearing sensory cells. In the second place, it could not be demonstrated that fishes react to sound.

Shortly after 1900, a number of experimenters demonstrated that some fishes at least perceive sound. Some of the experiments tested the spontaneous reactions of fishes to sound vibrations. Zenneck in 1903 set off a bell in a stream and observed that minnows in the vicinity of the bell swam away from the source of the sound whenever the bell rang. Also in 1903, Parker was able to demonstrate that a top minnow (*Fundulus*) reacted to the sound of a tuning fork held against the aquarium wall. These experiments were both of the "spontaneous reaction" type. In this type of experiment an animal was exposed to sound; if the animal gave a discernible spontaneous reaction it was concluded that the animal perceived the sound.

BELL-AND-FOOD TEST

A second general type of experiment, one giving more control to the experimenter, was brought into play. These experiments involved conditioned reflexes or learned behavior. The first use of this type of experiment was reported by Meyer in 1908. A description of Meyer's work will also serve as a description of the conditioned reflex experiment. Using goldfish, Meyer rang a bell and then presented the fish with food. This procedure was repeated, the food being dropped at a particular point each time and the observer remaining out of sight of the fish. Eventually the fish came to the feeding point when the bell was rung whether or not food was presented. Inasmuch as the sound of the bell was the only stimulus that could have brought the goldfish to the feeding point, it was concluded that the fish could perceive sound vibrations. Similar experiments were carried out subsequent to 1908 in the United States, England, Germany, Holland, Hungary, and Austria on both fresh-water and marine fishes of various families.

Another aspect of the hearing of fishes investigated by the same type of experiment was the limit of tone perception. It was discovered that the upper limit of pitch discernible by European minnows of the genus *Phoxinus* lay between the tones designated by musicians as d^5 and a^5, that is, between 4,645 and 6,960 vibrations per second. Approximately the same upper limit was determined for several species of South American characins, a group of fresh-water fishes. The highest pitch to which any fish has been observed to react is $g\#^6$ (13,000 vibrations per second). This tone, to which a catfish reacted, is near the upper limit of man's hearing. The lower limit is more difficult to determine because low frequency vibrations may be picked up by the sense of touch, as anyone knows who has *felt* the vibrations of a kettledrum. Nevertheless, for the same European minnows the lower limit was determined to lie approximately between one and two octaves below middle C (*see Fig. 3*).

TONE CHANGE RECOGNIZED

The ability of fishes to differentiate between tones has also been tested. Stetter in 1929 fed *Phoxinus* and *Ameiurus* (a North American catfish) after sounding a note. In a short while, the fishes were conditioned to giving the feeding reaction immediately after the sound by coming to the surface, snapping, and seeking food. Stetter then sounded a note two octaves higher. If the fishes gave a feeding reaction to this second sound they were tapped with a glass rod. The fishes finally learned to give the feeding reaction at the proper tone and hid at the "warning" sound. The next step was to reduce the pitch interval between the feeding and warning tones. The individual fish showing the finest tone discrimination could distinguish between $g\#^2$ (821 vibrations per second) and e^2 (652 vibrations per second). A second fish could distinguish between d^1 (290 vibrations per second) and f^1 (345 vibrations per second). It is important to note that these tones were not given one after another or in any regular fashion, but instead both sequence and intervals were erratic.

Stetter, among others, was interested in the sharpness of hearing in fishes. He was able to determine this quality for *Phoxinus* in an entertaining and ingenious fashion. The minnows were placed in an aquarium in a hall that was 400 feet long. The fish were trained to come for food at the sound of a horn. With human observers stationed at the tank, Stetter moved the source of the sound away, always sounding the horn with the same intensity. The fish gave the feeding reaction, that is they heard the sound, until the horn was moved 200 to 260 feet away. For the six human observers the sound was no longer audible when the horn was moved beyond 330 feet.

Inasmuch as sound loses some of its intensity in moving from air to water, Stetter still did not have a good comparison between the acuity of hearing in fishes and that in man. Consequently the human observers were completely submerged in a tank. Under these conditions the sound was no longer audible to them when the horn was more than 165 feet away. The same type of experiment has shown that in the group of fresh-water fishes that includes the minnows, the catfishes, and the characins the individual fish has approximately the same auditory acuity as man. No determinations of this aspect of hearing are available for other fishes.

HEARING VS. FEELING

All of the above experiments merely indicate that fishes are sensitive to sound vibrations. However, the question of whether fishes actually hear is not demonstrated by these experiments. Generally, in vertebrates by hearing is meant the

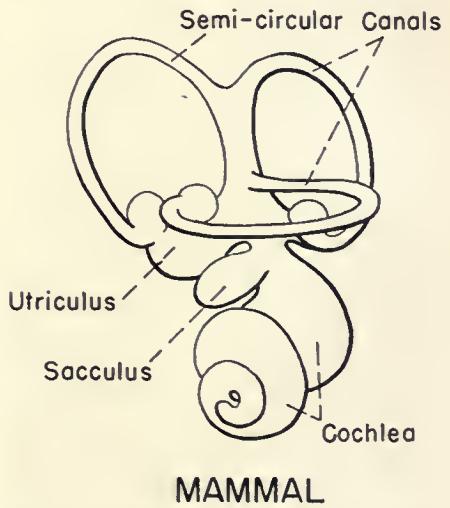

Fig. 2. The inner ear of a mammal (compare with Fig. 1).

perception of sound vibrations by the inner ear with the nerve impulses to the brain traveling over the auditory or eighth cranial nerve. The distinction that must be made is between hearing a tone and feeling a vibration. The basic method of determining

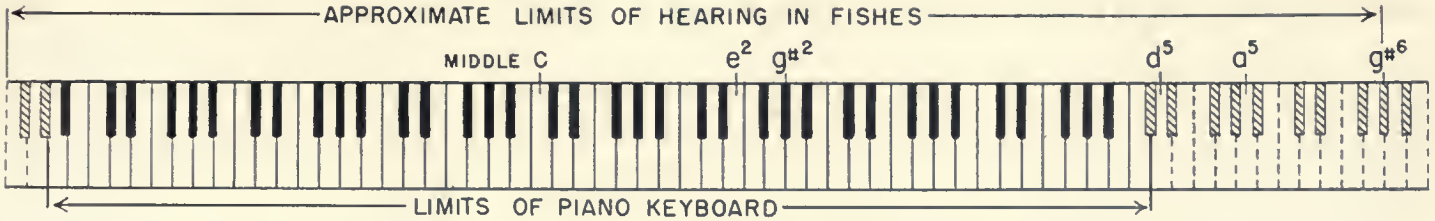

Fig. 3. The limits of hearing of fishes relative to the piano keyboard. Drawings by Margaret G. Bradbury.

whether or not fishes actually hear according to this definition involves experimental operations on parts of the inner ear. In any operation on animal subjects, shock is an important factor in the result. Before the result of any such experiments may be considered valid it is first necessary that the fishes survive in order to demonstrate that the results obtained were not due to shock.

Bigelow in 1904 trained goldfish to react to a tone. He then cut the auditory nerve on both sides of the head, after which the fishes no longer reacted to the tone. To make sure that they were not suffering from shock, Bigelow drilled holes in the head of other goldfishes down to the position of the nerve. Goldfish so treated lived for weeks; they apparently suffered no shock. These fishes also reacted to sound. Bigelow then cut various other nerves without any change in the reaction to sound. He then cut the auditory nerve and immediately the reaction disappeared. Consequently Bigelow concluded that the fishes perceived the sound vibrations through the inner ear.

Another series of operations, this time on the inner ear or labyrinth, discovered the part of the inner ear that was involved in the hearing of fishes. These experiments were conducted by von Frisch on the minnow *Phoxinus*. It had been well established that the semicircular canals and the utriculus (*shown in Fig. 1*), together forming the pars superior of the inner ear, constitute the organ of equilibrium in all vertebrates. Von Frisch removed this pars superior. After the operation, his minnows were not able to maintain their balance but they could still be conditioned to sound. After they had lived for several months, thus proving that they did not suffer from shock, the fishes were autopsied to be sure that all of the pars superior had been removed. This experiment showed that the semicircular canals and the utriculus were not involved in the sense of hearing.

FINAL RESULTS AFFIRMATIVE

Next, von Frisch conditioned more minnows to sound. He then removed the other parts of the inner ear, the sac-like sacculus and its adjacent lagena (*see Fig. 1*), from the same species but left the pars superior intact. The fishes were able to maintain their balance after the operation but no longer reacted to sounds of pitch higher than 145 vibrations per second. Vibrations of this low frequency are very likely picked up by the sense of touch, for it may be recalled that the same species normally has an upper pitch limit of around 4,645 vibrations per second. The fishes involved in these experiments lived as long as one and one-half years. Obviously the results obtained were not due to the shock of the operation. The conclusions to be derived from these operations on the labyrinth are that fishes do hear and that the seat of the sense of hearing is in the sacculus and lagena.

In addition to the conclusions concerning hearing in fishes, two other general statements may be made on the basis of the experiments described: First, the erroneous impression of most 19th century biologists about this problem was the result of reliance upon anatomical observations for physiological conclusions. Although the study of the anatomy of an animal frequently gives clues to its physiology and behavior, such observations cannot take the place of properly designed and executed experiments. Secondly, biologists from a number of countries contributed to the final clarification of the problem of hearing in fishes. It is generally true, not only in science but in other fields as well, that advances in human knowledge are made by the efforts, sometimes co-operative and sometimes independent, of men from all parts of the world.

AFRICAN BIRD PAINTINGS BY LOUIS A. FUERTES

A reprint of eight bird plates from the *Album of Abyssinian Birds and Mammals*, paintings by Louis Agassiz Fuertes, has recently been placed on sale at THE BOOK SHOP of the Museum. Selected for their suitability for framing and printed from the original lithographic plates, the pictures retain the fine quality of color reproduction that made the first edition a noteworthy example of the printer's art.

In the new printing, borders have been increased slightly to over-all dimensions of 12 by 14 inches so that further matting of the prints is unnecessary in framing. The subjects represented are: Pigmy Kingfisher, Gray-headed Kingfisher, Swallow-tailed Kite, Black-shouldered Kite, Helmet Shrike, Cape Teal, Narona Trogon, and Sand Grouse. The set is priced at $2. Individual pictures already framed in an attractive gray molding also are available at $5 each.

The *Album of Abyssinian Birds and Mammals* was first published in 1930. Now completely out of print, this portfolio of accurate lithographic reproductions of paintings of birds and mammals made by the late Louis Agassiz Fuertes while he was a member of the Field Museum–*Chicago Daily News* Abyssinian Expedition of 1926–27 is representative of the best work of this noted American artist. The original collection of 132 paintings was presented to the Museum by C. Suydam Cutting, Honorary Member, Contributor, Patron, and Corporate Member of the Museum, who was in the expedition party and whose further generosity made possible the publication of 32 of the paintings in portfolio form.

Gem Students in Museum

The Gemological Institute of America is holding a refresher course at the Museum in the identification and evaluation of precious stones for those engaged in the jewelry trade and for apprentices and others considering entering it. The course, in charge of Lester Benson and an assistant, has enrolled 18 students.

ART STUDENTS' DRAWINGS DISPLAY MUSEUM MOTIFS

Drawings by students in the School of the Art Institute of Chicago, who meet periodically for class work in Chicago Natural History Museum, will be shown in a special exhibit to be held in Stanley Field Hall, May 1 to 31, inclusive. The exhibited work was selected from drawings accumulated during the past year by two of the teachers, Miss Ethel Spears and Miss Bertha Lukens.

The pictures, which include water colors, chalk drawings, block prints, and paper cut-outs, are based on material exhibited in the Museum and represent the work of students in two divisions of the School of the Art Institute. Part of the exhibit is by students of the Junior School, ranging in age from 10 to 17 years, who meet in the Museum each Saturday. The rest of the work is by first-year students in the general drawing classes of the School, from 18 to 40 years of age, who meet once a month in the Museum classroom and exhibition halls.

FROM PORTOLANO CHARTS TO MODERN SEA GUIDES

By META P. HOWELL
LIBRARIAN OF THE MUSEUM

Charts and maps are the outcome of man's desire to give geographical expression to his knowledge concerning the nature and the distribution of the earth's surface features and to place them on record. It is from the Greeks that we have obtained our earliest knowledge of geographical maps, and it is a fact that all discovery and exploration led to map making. However, the origin of maps is clouded in as much obscurity as the invention of letters. Much can be written about the maps of antiquity. But in the important function of collecting specimens for the Museum from the sea, we are most interested in early sea-charts, the forerunners of the modern coast and geodetic survey maps and the charts and sailing directions published today by the hydrographic offices of the various governments.

EXAMPLE OF A PORTOLAN CHART PUBLISHED IN 1669
Australia and the East Indies, from Peter Goos's Sea Atlas, issued in Amsterdam.

These early charts are known as the Portolano Charts. They were drawn in the first years of the modern age primarily for mariners engaged in coastwise sailing, but they likewise served as a guide for the bolder navigators in the beginnings of the oceanic stage of modern European expansion, when by sea, rather than by land, the unknown world was beginning to be penetrated. They are the first modern sailors' charts, the first of modern charts scientifically constructed and made by navigation.

On these navigators' charts, the coast lines were carefully drawn and the ports inserted, on which account they are known as Portolano or Portolan Charts. The early pilots or mariners who constructed the charts gave the outline of the coasts, the position of harbors, and every kind of information that could be useful. The coast and geodetic survey maps now used as a basis in planning museum expeditions developed from these charts. Cosmographers of that day cared little for the scientific labors of the Arabs. They did not, in constructing their nautical charts, avail themselves of the longitudes and latitudes collected by the Arabs or construct their maps upon any mathematical or scientific basis. What they laid down upon their maps was what had been obtained from actual observation. All information procured in this way was carefully collected and preserved, as is done today on the modern charts carried by museum staff members on their expeditions.

In preparing the Portolano Chart, the care of the cosmographer was to give as accurately as possible outlines of coasts, to indicate the promontories, the dangerous points, the shallow places, the reefs, the curvatures of gulfs and bays, and the sinuosities of the shore, and to fix the distance of one position from another with some exactitude. In addition to this, the Portolano was annotated with other information useful to the mariner, and these Portolanos furnished the material for more general charts and maps of the world.

The charts of the Mediterranean and the Atlantic coasts form quite a distinct representation of geography. They antedate 1270 and are of surprising exactness, illustrating principally the Portolano or sailing directions in use among the seamen on the Mediterranean. Materials available even in the days of Ptolemy are embodied in them. The charts are based upon estimated bearings and distances between the principal ports or capes, the intervening coastlines being filled in from more detailed surveys. The bearings were dependent upon the seamen's observations of the heavens, for these charts were in use long before the compass had been introduced on board ship (as early as 1205, according to Ginot de Provins).

COLORFUL CREATIONS

The charts can be readily recognized by one of their most characteristic features: groups or systems of rhumb-lines (straight lines in the direction of different winds) radiating from a common center. The distances on the land or over the sea were laid down from certain fixed points and hence these maps are covered with a network of lines running in all directions from central points, called wind roses (Roses de Vente) or compass roses. These points of intersection were created with great artistry of color and beauty. The central group was generally encircled by eight or sixteen satellite groups. The predominating colors used in the construction of the charts were red, yellow, blue, green, black, gold, and silver.

Each chart was furnished with a scale of Portolano miles, whose length was 1,233 meters. Generally drawn on parchment or vellum, the charts have been preserved to us in two forms—either in single sheets produced in facsimile or in sheets bound together as an atlas. In the single-sheet chart, the size was determined by the size of the skin on which it was drawn, it being true in most cases that the entire skin was used, even the neck portion being retained, a fact that accounts for the peculiar and apparently unnecessary extension on the sheet, usually on the left.

More than 100 of these charts antedating 1500 are extant. The most important of these are the Portolanos of the early 14th century. The oldest of these maps is the Pisan Chart or Carte Pisane. This famous chart, the work of a Genoese artist, delineates the coast of the Mediterranean with surprising accuracy. Its first copy dates from 1300 (Pisa) and it was copied over and over again with some modifications until 1620. So good was the chart that it was used for actual navigation for more than three centuries.

MERCATOR'S CONTRIBUTION

The expansion of Portolano Charts into maps of the world resembles the wheel maps

of the earlier period. Gratiosus Benincasca was one of the most noted of Portolano chart or map makers, his works dating from A.D. 1435 to 1482. The Portolano charts were followed by many famous maps, such as the celebrated Catalan map of the world executed in 1375. This map is on parchment, beautifully colored and mounted to fold like a screen. It was extensively copied and reproduced in all the maritime cities of the Mediterranean for the use of mariners, and for a long time it was the map in use for all practical purposes.

Among other outstanding maps are the Juan de la Cosa map of 1500 and the Ribaro map. These maps could be called charts rather than maps, as their emphasis is more on the sea than on the land. Mercator's World Map of 1569 is famous as the first map on Mercator's projection. When the fullness of its details is considered in connection with the new and scientific method upon which he projected it, Mercator is entitled to the appellation of "Father of Modern Cartography."

The maps were then followed by a revival of Ptolemy's work after Jacobus Angelus de Scarparia had translated it into Latin in 1410. His version was printed in 1475 and it influenced the construction of maps by the addition of degree lines.

FIRST ATLAS OF CHARTS

The first atlas of charts is the *Spiegel de Zeaveardt* of Lucas J. Waghenaer, published in 1584. The Dutch were the leaders in chart-making during the 17th century. After the Neptune Francois of 1693, the best charts came from Paris. These in turn were eclipsed by London in the second half of the 18th century. The Royal Hydrographic Office was founded in 1795, and it is interesting to note that the British Admiralty has been one of the leading producers of charts the world over. For expeditionary planning in Chicago Natural History Museum, these old Admiralty charts are invaluable in showing the location of the old places where specimens were found, and it is interesting to note that the charts, because of their historical recordings, proved to be more valuable on the. Museum's Bermuda Expedition in 1948 than the more recent hydrographic office charts.

From the middle to the end of the 19th century, Germany was considered the headquarters of scientific cartography. Nuremburg and Cologne were two prominent centers in the theory and practice of geographical science. Martin Waldseemuller, a cartographer of note, was the scholar who gave America its name in his *Cosmographiae Introductio*. His map of the world, "Universalis Cosmographia," constructed as a globe in 1507, was an outstanding achievement. Today, the geographical establishments in Germany, particularly that founded by Justus Perthes (1785) at Gotha, occupy high rank.

The United States Coast Survey was founded in 1807 and was organized under Ferdinand Hassler, a Swiss cartographer. The first charts appeared in 1845, and since then charts of all the coasts of the United States and its dependencies have been produced. In 1878, the name of the office was changed to U.S. Coast and Geodetic Survey, after the great transcontinental arc of triangles from Atlantic to Pacific was carried through.

USE IN MUSEUM RESEARCH

Modern sea charts, outgrowths of the old Portolano Charts, are distinct aids to scientific research. In planning an expedition for the purpose of collecting marine fauna, for example, they play a role of much consequence. A systematic study of the charts covering the area to be visited is made, and oceanographic and ecological data compiled. The exact localities where the wanted or unknown specimens may be found are decided upon, the charts furnishing the essential data by their graphic presentation of coast elevations, contours, banks, reefs, depths, etc. In deep-sea dredging, the chart is used for the 1,000-fathom contour by fixing the exact position and bearings from the locality of the lighthouses, as in the recent Bermuda expedition. An examination of the chart determines how deep to set the traps or drag nets, whether the area is a closed-in bay or a reef in shallow water, whether the waters are too deep for the use of poison or too shallow to be good fishing grounds, whether a reef is exposed or what its coverage would be at low tide. It is important to know the temperature of the water, the fresh-water streams entering the bay and where, and if there is a lake at the head of such streams. The maps are used for information relating to accurate soundings, the currents and depth of the water, as well as the nature of the bottom: whether shell, gravel coral, etc. The nautical terms recorded on the charts are useful as is the additional data in each section of a chart referring to the size of the nearest town or towns and the prevalent language.

In planning a recent Museum expedition to Florida, charts in the Library were studied to determine the character of the waters and the region where collecting was to be undertaken. Before departure, the charts were marked with all the places where Chicago Natural History Museum already had collected. While in the field, the charts again came into prominence, insuring the safe navigation of the coastal and intracoastal waters, the determination of geographical positions and elevations not only along the coasts but in the interior of the country, and providing fundamental data for the scientific investigations undertaken. They were in constant use, for all pertinent data discovered are recorded on the charts, which are later placed on file in the Museum Library and the Curators' offices not only as a valuable record but as part of the regular collection. Symbols are used in recording the necessary information, such as a circle to indicate the exact place where collecting is done and to show where the particular specimens come from. Later, smaller maps are redrawn from the large maps to show localities and to facilitate the work of future expeditions.

The Museum Library receives regularly many of the publications issued by the United States Coast and Geodetic Survey. These publications, covering works on the surveying and charting of the United States and its possessions, geodetic control, and other activities, include the annual reports, gazetteers, and coast and general charts. Among the publications of the United States Hydrographic Office received in the Library are the gazetteers to maps and charts and the sailing directions and pilot guides covering many regions of the world. The United States Hydrographic Office publishes the *International Code of Signals for the Use of All Nations*, of which a copy is in the Library.

It is now more than three centuries since Gerard Krehmer, better known to the world by the Latinizing of his name as Mercator, produced his large map of the world. The extent of the geographical knowledge of their time was graphically illustrated by the seamen in their Portolano Charts, and the beauty and technical perfection of their work has earned them the distinction of representing some of the finest examples of the science and art of that day. Since then, great progress has been made in the basic sciences stemming from these early documents, in astronomy, geology, and geography. The value of the Portolano Chart in its contribution to the interesting branches of the history of human progress and the growth of scientific research is almost unsurpassed.

FLORIDA REPTILE COLLECTING

A field trip to Florida and adjacent areas to obtain material for the exhibits of reptiles and amphibians got under way with the departure April 17 of Staff Taxidermist Leon L. Walters and Assistant Taxidermist Ronald J. Lambert. In addition to collecting, they will make in the field plaster molds of many of the specimens and take photographs and color notes needed later for making plastic reproductions in the Museum laboratories. Among the specimens especially to be sought are: alligator snapping-turtle, red-headed skink, rainbow snake, indigo snake, diamondback rattlesnake, blind lizard, Florida king snake, American alligator, and water moccasin and a number of frogs and salamanders.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The acquisition of the South Court (in the old Field Columbian Museum building) by the Department of Zoology gave room for an expansion of exhibition material, the demands for which had existed for some time. A fine group of the handsomest of

THE GREATER KOODOO
Now on exhibition in Carl E. Akeley Memorial Hall.

horned animals, the greater koodoo, made its first appearance. The specimens were collected on the Field Museum African Expedition of 1896 by Carl E. Akeley, who also prepared the habitat group. The horns of these graceful creatures have been known to reach 48 inches in length. From tip to base, the horns of the old male in the group, which is now on exhibition in Carl E. Akeley Memorial Hall (Hall 22), measure 38 inches.

MAN'S PAST IN S. PACIFIC—

(*Continued from page 3*)

found charred fragments of human bones. The evidence indicates this stratum contains the remains of crematory pyres. Beneath the ash stratum was a layer of sandy soil mixed with pottery fragments, some of which are of a type heretofore not known to exist in the area. Below this stratum was found a series of deep burials made in neatly constructed pits. The burials had been covered with white beach sand. The teeth of a number of skeletons were a red brown, evidence that these early men chewed betel nut, which even today is widely used among the Chamorros and is the local version of chewing gum.

The fourth site—a shell midden—is under excavation and what it contains will be reported later. To date, the expedition has made a start in establishing a chronology for the development of prehistoric culture in the Marianas and has added materially to our knowledge of the way of life of the ancient inhabitants of these Pacific islands.

SEEKS RARE SALAMANDER OF ARKANSAS-OKLAHOMA

A quest for an elusive and somewhat mysterious species of woodland salamander began April 13 with the departure of Clifford H. Pope, Curator of Amphibians and Reptiles, for the Ouachita Mountains of western Arkansas and eastern Oklahoma. The rare creature sought bears the scientific name *Plethodon ouachitae*. The nearest relatives of this Ouachita species live in the southern Appalachians where Curator Pope has studied them intensively.

"This brightly colored woodland salamander can be found only during protracted rainy spells. At other times it disappears, presumably into deep cavities of the forest floor," says Curator Pope. "One recent expedition failed to find a single specimen because of the adverse (clear) weather conditions encountered.

"The aim of the present exploration will be to make a study of the western species in hope of unraveling something of the evolutionary history of the group. The Appalachian species of the salamander has already been intensively studied in Museum field work. The colors of these amphibians fade so rapidly at death that the specimens must be examined at the time of preservation; hence it is necessary to study them at first-hand in the field rather than bring them preserved to the Museum laboratories."

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

From: Dr. Ralph F. Palumbo, Seattle, Wash.—7 specimens of marine algae, Bikini atoll; New York Botanical Garden, New York City—51 herbarium specimens, Ecuador; Dr. Maxwell S. Doty, Evanston, Ill.—400 specimens of miscellaneous fungi and mosses; Dr. V. J. Chapman, Auckland, New Zealand—6 specimens of algae, New Zealand; Dr. Ben O. Osborn, San Angelo, Tex.—2 specimens of algae, Oklahoma; Harold B. Lauderback, Argo, Ill.—4 specimens of marine algae, Florida; Sidney F. Glassman, Norman, Okla.—24 cryptogamic herbarium specimens, Caroline Islands; Dr. Paul O. Schallert, Altamonte Springs, Fla.—22 specimens of algae, Florida; Dr. Eula Whitehouse, Dallas, Tex.—59 specimens of algae, Texas; University of Illinois College of Pharmacy, Chicago—1,874 herbarium specimens, United States and Europe; Dr. Grace C. Madsen, Tallahassee, Fla.—117 specimens of algae, Florida; Lillian A. Ross, Chicago—11 cryptogams, Isle of Pines, Cuba; Herman Silva, East Lansing, Mich.—13 specimens of algae.

Department of Geology:

From: Dr. and Mrs. R. H. Whitfield and Jon Sharratt Whitfield, Evanston, Ill.—256 fossil plant specimens, Illinois.

Department of Zoology:

From: Boardman Conover, Chicago—242 bird skins, Brazil; Chicago Zoological Society, Brookfield, Ill.—a baby hippopotamus and a bird skin; Dr. William C. Ohlendorf, Park Ridge, Ill.—257 miscellaneous bird skins, North America; Dr. Clarence J. Goodnight, Lafayette, Ind.—2 phalangid paratypes, Mexico; R. E. Hildebrandt, Maywood, Ill.—a mammal skull, Florida; C. A. Frost, Framingham, Mass.—a Histerid beetle, California; Harry Hoogstraal, Chicago—119 reptiles and amphibians, 362 mammals, and 25 miscellaneous fresh-water fishes, Africa; Henry S. Dybas, Hazelcrest, Ill.—2,028 insects, mostly United States, Colombia, and Mexico; Dr. Sidney Camras, Chicago—500 flies, United States; Bernard Benesh, Sunbright, Tenn.—310 insects, Tennessee; John F. Kurfess, San Diego, Calif.—a bird skin, China.

LECTURE TOURS IN MAY, DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., May 3—Steps to the Scientific Age—Early Sciences (*Anne Stromquist*).

Fri., May 5—Toys—Ancient and Primitive Playthings. Illustrated introduction in meeting room (*Harriet Smith*).

Wed., May 10—Primitive Fraternities (*June Buchwald*).

Fri., May 12—Plants and Animals through the Ages. Illustrated introduction in meeting room (*Jane Sharpe*).

Wed., May 17—Courtship in the Animal World (*Lorain Farmer*).

Fri., May 19—Wild Flowers of the Chicago Region. Illustrated introduction in meeting room (*Miriam Wood*).

Wed., May 24—Defense Weapons of Animals (*Jane Sharpe*).

Fri., May 26—The Story of the Dunes. Illustrated introduction in meeting room (*Marie Svoboda*).

Wed., May 31—Traveling Kits—How Primitive People Transport Their Belongings (*Harriet Smith*).

Persons wishing to participate should apply at North Entrance. Tours are free.

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Members are requested to inform the Museum promptly of changes of address.

BOARDMAN CONOVER, 1892-1950

Through the death of Boardman Conover on May 5, 1950, at the age of 58 years, Chicago Natural History Museum lost one of its staunch supporters, its Board of Trustees a valued member, its Division of Birds an active worker, and its staff a warm friend.

Boardman Conover

Mr. Conover was born in Chicago, January 19, 1892. He was graduated from Yale Sheffield Scientific School in 1912 and worked as a civil engineer with the U. S. Reclamation Service in New Mexico and with the Pennsylvania Railroad. He was associated with the Stewart Manufacturing Company of Chicago for three years. He joined the armed services in 1917 and served overseas as an artillery lieutenant with the 86th Division of the U. S. Army. In 1920 he became associated with the Museum.

He was an outstanding ornithologist, specializing in game birds. As Research Associate in the Bird Division of the Museum he carried on an active research program, built up a collection of his own, and helped to build up the Museum's collections as well. In recognition of his many services and contributions the Trustees had honored him by electing him, at various times, a Life Member, a Patron, a Contributor, and a Corporate Member of the Museum. In 1940 he was elected a member of the Board of Trustees.

The Conover Collection of game birds was housed in his office and laboratory in the Museum and numbers more than 17,000 specimens. Certain groups, such as the francolins of Africa, are perhaps better represented in this collection than in any other museum in the world. Mr. Conover left no avenues unexplored in his efforts to make the collection as complete as possible. He participated in a number of expeditions himself. In 1920 he accompanied Dr. Wilfred H. Osgood, former Chief Curator of the Department of Zoology, on an expedition to Venezuela, and in 1922 he took part in an expedition to Chile with Dr. Osgood and Colin C. Sanborn, now Curator of Mammals. Shortly after his return from Chile he made an expedition to Alaska. Mr. Conover's most important expedition was in 1926–27, when with R. H. Everard of Detroit he financed and led the Conover-Everard Central African Expedition of Field Museum. Accompanied by former Assistant Curator John T. Zimmer they collected birds and mammals in Tanganyika Territory, the Belgian Congo, and in Uganda. In addition to his own field work Mr. Conover financed collectors in many places—from Australia to Borneo, in southern Asia, Southwest Africa, and Peru, and he purchased and exchanged material widely. Game birds were always sought in these collections but as general collections were received, he donated to the Museum the non-game species. As he once stated, he was pleased if 10 per cent of the collections he received were game birds for his own collection.

His collection of game birds formed the basis of the material for his research. His interests were taxonomic—the naming and describing of the different kinds of birds and the arrangement of them in a sequence that would show their relationships. Mr. Conover's published papers are now some thirty-eight in number; certain revisions of South American tinamous are still in press. In addition to descriptions of new kinds of birds and revisions of groups, Mr. Conover participated in the preparation of the monumental *Catalogue of Birds of the Americas*. This great work, now complete in fifteen books, was started by Dr. Charles B. Cory, the first curator of ornithology in the Museum, the first part being published in 1918. It was continued by Dr. Charles Hellmayr until 1944, and the last four parts were completed by Mr. Conover.

The affiliations that Mr. Conover had with scientific societies included, among others, the American Ornithologists' Union of which he was a fellow, the British Ornithologists' Union, the Biological Society of Washington, American Geographic Society, and the Chicago Zoological Society of which he was a trustee.

The Board of Trustees of the Museum, at its meeting held May 22, adopted a resolution of regret over the death of their fellow Trustee, Boardman Conover. The Board posthumously elected him a Benefactor of the Museum, thus assuring recognition in perpetuity of Mr. Conover's many important and valuable gifts both of collections and money, as well as the contribution of a major portion of his time and energy in research as a member of the Museum staff. The Board acted further to honor the memory of Mr. Conover by voting to name Hall 21, the hall housing the systematic bird collections, Boardman Conover Hall.

At the same meeting the Trustees posthumously elected the late Emil Eitel of Chicago as a Contributor (Contributors' names remain on the rolls in perpetuity in recognition of notable gifts to the Museum).

THIS MONTH'S COVER

The Sahara desert and Tibetan highlands are the only areas of Africa and Asia where the leopard is not found. The islands of Java, Sumatra, and Borneo are also occupied by this cat, everywhere respected for its strength and agility as a killer. When wounded or surprised it will not hesitate to attack man, and more than one expedition from this Museum has experienced brushes with leopards in Africa, none of them, fortunately, being fatal.

There is only one species of spotted leopard but there are many local races based on differences in size and color. A black or melanistic phase is common in southeast Asia. The leopard, like other cats, is nocturnal and carnivorous and preys on deer, antelopes, pigs, sheep, goats, monkeys, birds, and reptiles, and in a few instances individuals have been known to become man-eaters.

The Museum exhibit shown on the cover portrays a leopard crouched in a fig tree in India, waiting for some animal to pass below it. The specimen was collected by the late Colonel J. C. Faunthorpe; the group was prepared by former Staff Taxidermist Leon L. Pray, assisted by Frank Letl. —C.C.S.

MUSEUM ARCHAEOLOGISTS TO EXPLORE NEW MEXICO CAVES

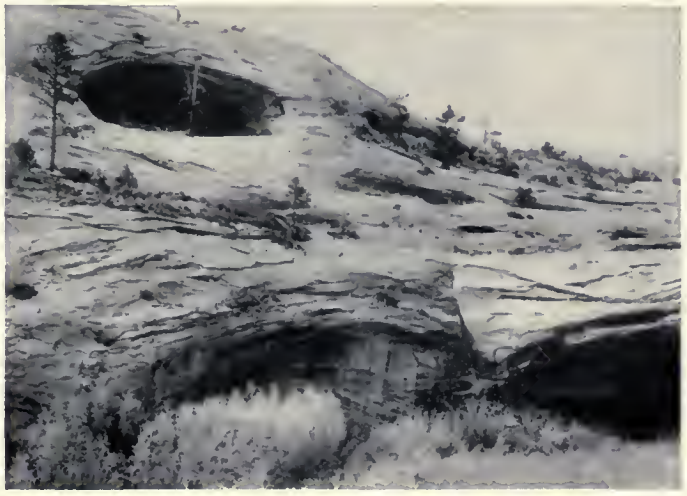
By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

Sometime toward the middle of June the writer and his associate, Dr. John B. Rinaldo, Assistant in Archaeology, will begin the sixteenth season of archaeological work in western New Mexico. Each year as the time for departure from Chicago approaches, Rinaldo and I are busy checking lists and ordering tools, rope, photographic supplies, bags, cartons, and so on ad infinitum. Since it takes about a month for the expedition supplies to reach camp headquarters, everything must be securely packed and dispatched from the Museum by the middle of May. As this deadline draws near, there is a last-minute bustle to finish. Each year the archaeologists find these tasks exciting because they are a prelude to a new season of archaeological work with hope for fresh discoveries.

What do the members of the expedition expect to accomplish this season?

Before answering this question, it may be well to summarize what has been done in the preceding field seasons.

The west-central part of New Mexico lies in the approximate geographical center of the southwestern United States. We realized that it was, in 1939, well nigh terra incognita. A new culture called Mogollon, named after near-by mountains and pronounced "Mog-ee-yoan," had been discovered in this geographical center by Harold S. Gladwin and Dr. Emil W. Haury but had not been well defined. Therefore the area posed an imperative archaeological challenge, and digging was consequently undertaken by the Museum.



PREHISTORIC CAVE HABITATION

Type of site to be excavated this summer by the Museum's Archaeological Expedition to the Southwest.

CENTURIES ROLLED BACK

Since our shovels first broke earth in 1939 an amazing amount of new and important data have been uncovered. When pieced together, the small bits of information form a mosaic that, although not yet complete, reveals a fairly clear picture of what the American Indians were doing in that part of the world from about 1500 B.C. to A.D. 1000.

The first migrants to this part of New Mexico probably came from southern Arizona. They were ignorant of agriculture and pottery-making and eked out an existence by collecting nuts, seeds, berries, and roots, supplemented by a little hunting. These first-comers to Pine Lawn Valley (the name given to the area in which the Museum expeditions have labored) are therefore called Food-Gatherers.

Some time before the time of Christ, maize or corn agriculture was introduced into the area, and shortly afterward there appeared pottery and a type of house called a "pit house" (a hole in the ground with a roof over it), important traits that came from an unknown source. Thus it was that a revolution took place in the way these Indians lived. No longer did they have to depend on wild foods only. Life was elevated to a higher plane, and time for leisure —and thus for inventions—was achieved. From the time of the introduction of these traits to about A.D. 1000, a gradual improvement in material culture took place: better-made and more beautifully decorated pottery vessels, more efficient tools of bone and stone, better-built houses.

PROBLEM OF PERISHABLES

This mosaic picture gives a fairly clear idea of the history of this region for about 2,500 years, that is, from about 1500 B.C. to A.D. 1000. But this picture shows only the part of the Mogollon culture that was durable and imperishable because the materials recovered are entirely of stone, pottery, and bone.

Did the Mogollon Indians (our name for these ancient people) wear clothing, make baskets, weave sandals, work in wood and leather? If so, what did these things look like? In other words, what can be found out about the *perishable* objects of the material culture? If any information is forthcoming, it will add enormously to present knowledge, make possible deductions concerning the life of those times, and give some clues concerning the fundamental laws of the formation of culture and changes in it.

Therefore, before investigating the life of the Mogollon Indians after A.D. 1000, which can be put off to another season, the expedition will attempt this season to uncover the perishable objects made and used by the Mogollon Indians. Why have these things not been found before? Because all digging so far has been confined to open sites in which, because of moisture and consequent decay, perishable objects have long ago totally disintegrated. But in *caves*—that is, in *dry* caves—there might be a chance to recover these precious materials.

FOUR CAVES LOCATED

Unremitting search in previous seasons had failed to locate dry caves. But in 1949, with extraordinary luck—and much of archaeology is luck, four caves were discovered. It is necessary to dig these caves quickly before relic hunters get in their destructive strokes.

Cave-digging, then, will form a major part of the summer's work. Artificial light and special dust-masks and goggles will have to be used for this arduous work, for the dust in these caves has lain undisturbed for centuries. The slightest disturbance causes it to rise and remain in fine suspension for hours. Precautions are in order, too—even gasoline lanterns might cause an explosion. So electric lights will be used.

But always dangling before the eyes of the archaeologists will be the lure of possible finds of importance and value. All efforts and discomforts will seem as naught if the "digging is good!"

Fossil Plant Collecting

George Langford, Curator of Fossil Plants, and Dr. and Mrs. R. H. Whitfield, Associates in Fossil Plants, with Jon S. Whitfield, their son, went to Tennessee and Mississippi in the middle part of May to collect fossil plants from the Cretaceous and Eocene deposits of the Gulf Embayment of the Coastal Plain.

Party to Collect Utah Fossils

The Utah Paleontological Expedition is due to leave Chicago on June 15. Dr. Robert H. Denison, Curator of Fossil Fishes, and William D. Turnbull, Preparator, plan to work in the Bear River Range in the northern part of the state. They will be accompanied for about three weeks by Bryan Patterson, Curator of Fossil Mammals. A thorough search will be made of the early Devonian limestones, in which last year's reconnaissance trip revealed an interesting variety of primitive armored fishes.

VICIOUS CIRCLE OF MALARIA: MAN TO MOSQUITO TO MAN

By RUPERT L. WENZEL
ASSISTANT CURATOR OF INSECTS

"In this march[1] from Natal, up from the coast and along the Jaguaribe valley nearly one hundred thousand people became infected with malaria, of whom about twenty thousand died. Like hordes of blood-thirsty Huns the mosquitoes advance, leaving always a trail of mourning and destruction in their wake."

Such was the commentary of a Brazilian health official, writing on the 1938 epidemic of malaria that paralyzed the northeast of Brazil, an area of only several hundred thousand inhabitants. Perhaps one can better comprehend the devastating effect of the epidemic if it is explained that malaria is primarily a disease of rural areas; hence the larger cities were not as greatly affected. The devastation of the rural areas, however, was almost complete, with entire villages wiped out. The epidemic was spread by an African malaria mosquito, *Anopheles gambiae*, that accidentally was introduced in the neighborhood of Natal, Brazil, about 1930.

Accounts such as the above help one understand why malaria is sometimes called the most important of all diseases of man. It is by far the most important of the parasitic diseases of man and of all the insect-borne diseases. Therefore, in developing plans for an insect hall in the Museum, it was decided that of the exhibits that are to deal with the relation of insects to human welfare, one should be devoted solely to mosquitoes and malaria. This exhibit was completed and installed in Albert W. Harris Hall (Reptiles, Amphibians, and Insects—Hall 18) last month.

The new exhibit essentially consists of two series of models. One series illustrates the life history of the most important malaria mosquito of North America (*Anopheles quadrimaculatus*). The other series shows, diagrammatically, the manner in which malaria parasites are transmitted by mosquito to man and from man to mosquito and the developmental changes that they undergo within each of these hosts. Also included in the exhibit are a map of the malarious areas of the world and a painting of a breeding place that is typical for many kinds of malaria mosquitoes. The models were executed by James E. Trott, formerly Artist-Preparator in the Department of Zoology. The map and paintings were prepared by Miss Margaret G. Bradbury, Illustrator in the Department of Zoology, who also installed the exhibit.

WHAT IS MALARIA?

There are many popular misconceptions about the nature of malaria and the manner in which it is transmitted. Until the latter part of the 19th century it was generally believed that malaria was contracted by breathing bad night air that arose from swamps. Hence the name malaria—*mal* (bad) plus *aria* (air). This belief, based on the observations of people over many centuries, was not illogical. Malaria mosquitoes fly at night and many of them breed in swamps. Thus, a person who lived in the vicinity of swamps in a malarious area and at night ventured out of doors or left his windows open was apt to be exposed to the bites of infected mosquitoes.

Toward the end of the 19th century, the studies of A. Laveran, Sir Patrick Manson, and Sir Ronald Ross, particularly, demonstrated that the disease is caused by infection with one-celled animal parasites called plasmodia (Genus *Plasmodium*) and that these parasites are transmitted through the bite of mosquitoes. Plasmodia belong to the same animal group (Phylum Protozoa) as does the well-known *Amoeba*. Four species are known to infect man. Thus malaria is a collective term applied to a group of related diseases that are caused by infection with any one of a group of closely related parasites. Such animals as birds, lizards, bats, rodents, buffaloes, shrews, and monkeys may be infected by distinctive species of plasmodia. All plasmodia are transmitted by female mosquitoes. Those that cause human malaria can be transmitted only through the bite of females of particular kinds called *Anopheles* mosquitoes.

THE MALARIA CYCLE
MOSQUITOES CARRY MALARIA
ONE OF THE MOST IMPORTANT DISEASES OF MAN
LIFE HISTORY OF A MALARIA MOSQUITO

FINISHING TOUCHES

Margaret G. Bradbury, Artist in the Department of Zoology, completes the installation of the malaria mosquito exhibit.

HISTORICAL AND SOCIAL ASPECTS

Malaria may always have affected man. Certainly the parasites of human malaria are in nature found in no other animal, and the most closely related species of plasmodia are found in other primates. Just when the disease was first mentioned in ancient writings is difficult to determine, but early Chinese writers, and later Hippocrates, refer to at least two different kinds. References to malaria in the Roman literature by such writers as Virgil and Cicero are not infrequent. The highly malarious Pontine marshes surrounding Rome have played an important role throughout the history of that city.

In modern times malaria has affected the welfare of man perhaps more than any other disease. It takes an annual toll of millions of lives and is responsible for the economic decay and lack of development of large areas of the earth's surface. During World War I, the British, French, and German armies were virtually paralyzed by malaria on the Macedonian front. Following the war, mass population movements resulted in widespread epidemics in Europe. Russia suffered the worst malaria epidemic known in modern times. Other severe epidemics have taken place in recent years in Brazil and in Egypt. During World War II, malaria was one of the greatest hazards to military operations in the Pacific and the China-Burma-India theaters of operations. Some observers seriously believed that victory would belong to the side whose armies most successfully combated it.

DISTRIBUTION OF MALARIA

Human malaria is primarily a disease of the warm parts of the world, but one species of parasite (*P. vivax*) has successfully invaded large areas in the temperate zones. On the whole, however, climate limits the distribution of the disease. Figure 2 shows the areas of the world in which malaria is endemic or native. In North America malaria at one time extended as far north as Canada; it now occurs chiefly in the southern states. The time may not be far off when the disease will be relatively un-

[1] Of the mosquito, *Anopheles gambiae*.

common in the United States, providing public-health safeguards are maintained.

THE MALARIA CYCLE

Malaria parasites must undergo a separate cycle of development in both man and the female anopheles mosquito. The mosquito can become infected only by biting an infected person within whom the parasites have undergone certain developmental changes. A person, in turn, can become naturally[2] infected only through the bite of a female anopheles in which the parasites have undergone changes. This cycle of development and transmission is called the malaria cycle. It is shown in its simplest diagrammatic form in figure 1.

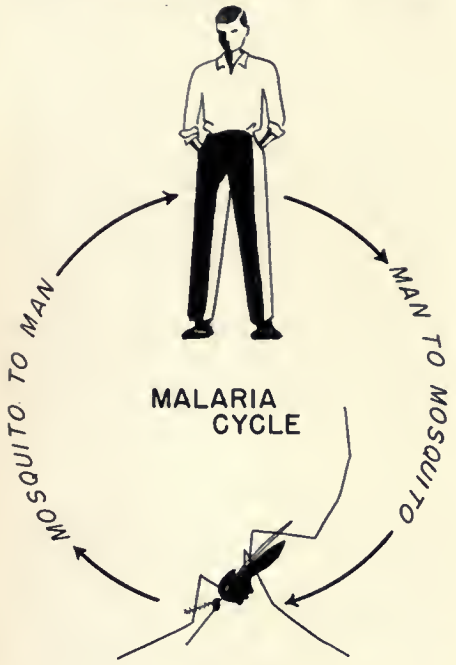


Figure 1

Inasmuch as the anopheles mosquitoes are the link that can be most effectively attacked in order to break the malaria cycle, it is desirable to note briefly their life cycle, characteristics, and some of their habits. Most mosquitoes belong to two large groups that are called Anophelinae and Culicinae. The latter group includes the greater number of described species, among them such familiar kinds as the common house mosquito and the yellow-fever mosquito. The life cycle of all mosquitoes consists of four stages: (1) egg, (2) larva, (3) pupa, and (4) adult. The first three stages are aquatic. The four stages of anophelines and culicines are compared in figure 3.

BREEDING PLACES

One commonly thinks of mosquitoes as breeding in almost any kind of water accumulation. However, most individual species have specific breeding requirements. The young of some species can tolerate a rather broad range of environmental conditions, for example, a wide range of acidity in the water; others are adapted to a very narrow range of conditions. Thus the early stages of some mosquitoes are confined to salt-water marshes; of others, to ponds or impounded water that has a certain amount of aquatic vegetation, a particular intensity of sunlight, and other characteristics.

Anopheles barberi of North America breeds only in water-holding treeholes. *Anopheles bellator*, an important malaria mosquito of South America, breeds only in the water that gathers at the base of the leaf axils of epiphytic bromeliads, plants of the pineapple family that grow on the limbs of trees. In general, most anopheles breed in standing or very slowly flowing surface water, such as swamps, ponds, sluggish streams, and rice paddies. A few breed in rather rapidly running water.

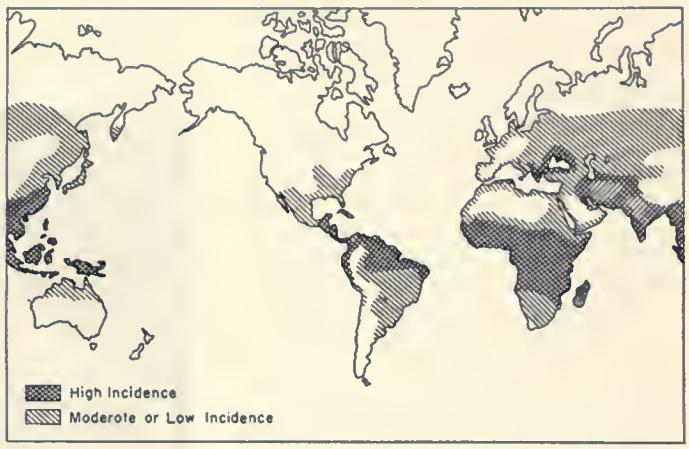


Fig. 2. Map showing distribution of human malaria throughout the world.

BITING HABITS

The biting habits of anophelines also vary considerably. The females of some

(*Continued on page 8, column 1*)

[2] The disease can be directly transferred from man to man by blood transfusion.

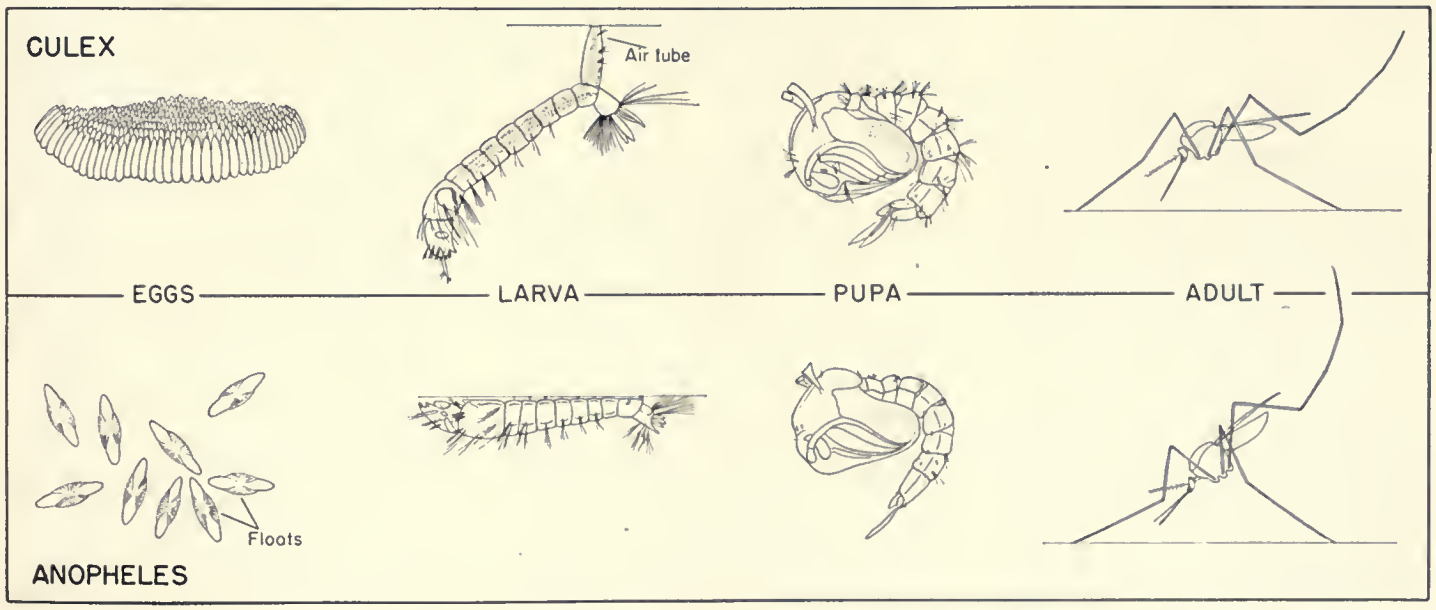


Fig. 3. Life stages of anopheline and culicine mosquitoes. Anopheles eggs have air floats and are never laid in rafts; the larvae lack an air tube and lie parallel to the water surface; the adults rest with the body at a marked angle instead of parallel to the biting surface. Drawings on this page by Margaret G. Bradbury.

THE SNAKE-BITE PROBLEM

By CLIFFORD H. POPE
CURATOR OF AMPHIBIANS AND REPTILES

"WHAT should I do if a poisonous snake bites me?"

This is the question that the reptile man dreads more than any other because it is one question for which he has no ready answer. About the best he can do is to change the subject. Just why is this simple question such a dreaded one?

Looking at the matter from the broadest point of view, there are three difficulties presented by the bite of a venomous snake:

First, there is no way of telling how much venom has been injected (the necessity of knowing will be brought out herein).

Second, snake venom, once mixed with the fluids of the body, cannot be separated from them by any known process.

TREATMENT A RISK

Third, every treatment for snake bite is of such a drastic nature that the victim must run considerable risk in subjecting himself to any one of them; his troubles are only initiated by the poison itself.

Any treatment might almost be described as adding insult to injury or, better still, adding injury to injury. Now it becomes clear why it is so desirable to know how much venom has been injected: if the amount is small, the effects of it may well be preferable to those of the treatment.

The first difficulty, that of being unable to determine the quantity of venom injected, has not been fully appreciated in the past because of the unjustified assumption that a snake discharges its full load whenever it bites. This is now known to be untrue. A large snake may bite and withold nearly all of its supply of poison, the process of biting being far from a completely automatic one.

AVOID FUTILE MAYHEM

The second difficulty, that of separating venom from body fluids, can also be disposed of quickly. One might think that a prompt cut at the site of the bite would cause the venom to flow out with the blood. However, the affinity of the body tissues for the venom is so great that the two become mixed instantaneously and the venom will not come out with any amount of bleeding. All the flesh surrounding the site of the bite would have to be cut out, and such mayhem is fraught with dangers. There is the story in point of the man who, bitten on one finger, seized a hatchet and cut the digit off at once. To his dismay he saw that, moving with such haste, he had hacked off two fingers instead of just one.

The third difficulty, the drastic nature of the treatments so far devised, cannot be dealt with so briefly.

Three scientific methods of treating snake poisoning have been developed, but no man can accurately say just what is the relative value of the three methods. Each method has advantages and disadvantages, and each one calls for much further investigation. Two schools of thought have grown up, and adherents of one school are often intolerant of the methods of the other. This state of affairs makes impartial investigation hard to carry on.

The three methods are correlated with three obvious ways of dealing with any poison: preventing its spread, extracting it mechanically, and neutralizing it. Extracting the venom by incision and forced draining and limiting its spread by a tourniquet are methods that may be almost as old as man. Neutralizing the venom is a recent scientific development based on medical knowledge that the ancients did not have. Immunization is not considered here because it would never have widespread use unless it could be achieved with great ease. Only those constantly exposed to danger from venomous snakes would need to be immunized.

'DON'T STEP ON ME'

Reproduction of a rattlesnake's head exhibited in Albert W. Harris Hall (Hall 18). Poison is ejected by the long, hollow, curved, sharply pointed fangs. A series of growing fangs is always ready to replace those broken in use or shed.

TOURNIQUET HAS HAZARDS

Preventing the spread of venom by a tourniquet is the simplest treatment and, used with discretion, it is very effective in dealing with some venoms. A tight tourniquet kept on too long will cause local congestion and prompt death from shock after its release. If this dire result is escaped, serious infections may develop to cause a slower death. Experiments have shown that the tourniquet need not be tight, and therefore the dangers from shock and infection can be avoided. Even so, the confinement of the venom in a limb for too great a period may cause loss of the limb. Again the importance of knowing how much venom has been injected comes to the fore, for it is certainly better to suffer the general effects of a sublethal dose of venom than it is to lose a limb by keeping the venom locked up in it with a tourniquet.

Venoms of the New World poisonous snakes, with the exception of the coral snakes, are in general held in check by the tourniquet. The damage they do is mostly to the blood and blood vessels; the poison is carried about by the lymph, which courses slowly through the body and is readily checked in its flow by a tourniquet. Venoms of the cobras and their allies, which are Old World snakes, and of our coral snakes are predominantly neurotoxic or nerve-damaging substances that do not seem to be easily checked by tourniquets, but the evidence on this point is contradictory and it is far from certain that the tourniquet is not of some value in dealing with neurotoxic venoms.

Application of a tourniquet, then, is an effective way of checking the spread of most New World venoms. The tourniquet should not be applied too tightly and it should be considered primarily a first-aid method to be used with discretion.

THE INCISION METHOD

Extracting the venom by making incisions at and around the site of the bite is a method that has been used to advantage in dealing with the same types of venom that the tourniquet checks so well. In fact, the two methods are often thought of as parts of a single one. As already explained, cutting is not simply a matter of letting the venom flow out immediately, and it is doubtful that incisions made over the actual fang punctures are of any more value than those made in the surrounding area. A great number of cuts must be made, preferably after some swelling has taken place. Before this there is little to cut and great danger of severing blood vessels, tendons, and nerves. The object of cutting is merely to drain off slowly the mixture of venom, blood serum, and certain waste products that accumulate to cause the swelling. In this way the amount of venom that eventually reaches the blood stream via the lymph can be greatly reduced.

But, as with use of the tourniquet, cutting is fraught with serious dangers in addition to the one already stated. The first of these to be encountered by the victim is the psychological difficulty of cutting. Many persons cannot cut themselves, or even a friend for that matter, and if they force themselves the strain is apt to bring on shock, or rather to increase the shock already brought on by fear. The use of local anaesthesia would of course help, but it could not prevent the nausea brought on many individuals by the sight of blood. The second danger from cutting is the great chance of introducing infection. Some sort of mild suction must be applied over each cut for many hours, since the proper kind of drainage is a slow one. Anyone would realize that this incision treatment should

be put in the hands of a competent physician as soon as possible.

DANGER IN ANTIVENINS

The third method, neutralizing the venom after it has spread more or less widely through the victim, was thought, when first developed within the century, to be the final solution to the whole problem. Experience of a few decades has slowly brought out the fact that grave dangers are associated with this method just as with the others. This serum, known as "antivenin," is made from the blood of immunized horses, and large quantities of it are required to neutralize appreciable amounts of venom. Many human beings react violently to antivenin, either by dying instantly or by suffering severely from serum sickness some days later. Just what the dangers from antivenin are can scarcely be estimated as long as the one school underestimates them while the opposing school exaggerates them.

After a century of investigation, modern science remains unable to cope with snake poisoning. There is little doubt that if the snakes of this country, let us say, annually killed thousands instead of scores, the problem would be solved in a very short time. It is hard to interest research physicians in a problem that does not exist in big cities where the institutions of medical research are concentrated. A real cure for snake bite might not save many lives but it would give tremendous mental relief to millions of persons living in the country and countless thousands of others who seek recreation in the wilds.

AN EXHIBIT REJUVENATED

By EMIL SELLA
CURATOR OF EXHIBITS, BOTANY

The recent installation of a large epiphytic aroid (*Anthurium acaule*), native of tropical America, is really a partial restoration. Completed in 1910, this particular reproduction remained on exhibition until a short time ago.

The species shown grows either as an airplant on branches of trees or on rocks. Its creeping stem produces large masses of aerial roots and its leaves often attain a length of four feet and a width of one foot or more. The flower spike is erect but becomes pendent when the fruit develops. All in all, its total assemblage is indeed striking.

In the course of rearranging the exhibits in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29) to take greater advantage of the recently introduced case lighting, we occasionally come across an individual specimen that requires something more than the usual cleaning and refreshing treatment. The anthurium was one of these; a close inspection of it revealed hidden damage to the leaves. This and the considerable darkening of the various pigments made it necessary to replace the foliage as well as some of the other parts in order to justify its remaining alongside the other reproductions. There were undoubtedly other causes for this condition than the natural aging processes, such as an accidental blow at the time it was being moved from the old Museum building in Jackson Park or possible exposure to some oxidizing agents that may have been present in the exhibition case.

Fortunately the necessary living material for these replacements could be obtained through the co-operation of the Garfield Park and Lincoln Park conservatories. Yet an unpredictable amount of time is always needed for the discriminating task of replacing part of the old with the new and matching the remainder so that one may not easily distinguish between them. This

ANTHURIUM ACAULE

Model of a tropical American aroid. This creeping or climbing perennial grows on trees or rocks. Exhibited in Hall 29.

reconstruction, shown in the accompanying illustration, is the result of the combined efforts of Frank Boryca and Samuel H. Grove, Jr., Assistants in Plant Reproduction, and Artist-Preparator Milton Copulos.

Australian 'Mountain Devil'

The Museum has received a specimen of an Australian reptile, the Moloch lizard (*Moloch horridus*). The creature, resembling American spiny desert lizards, is known in Australia as "mountain devil." Specimens are difficult to find. The one received at the Museum is a gift from A. R. Main, of the Zoology Department at the University of Western Australia in Nedlands.

The Moloch lizard, about 6 inches long, lives on a diet of ants. It looks somewhat like the horned toad.

BIRDS FROM NEPAL

The Museum recently had word that Dr. Robert L. Fleming is safely back from his successful bird-collecting trip to Nepal. Bird study and bird collecting have always been a hobby with Dr. Fleming, who is a teacher in the mission school Woodstock at Mussoorie in the United Provinces of India. He has visited the Museum staff when on vacation in Chicago, and he has long been one of our most valued correspondents.

Last summer he broached the possibility of a bird-collecting trip in the little-known country of Nepal to Boardman Conover, Trustee of the Museum and Research Associate in Birds. Mr. Conover was enthusiastic, for his own notable private collection of game birds would be enriched by collections from this region, which is remarkable for its wealth of pheasants. Nepal, lying just south of Tibet, has been a "forbidden country" and our knowledge of its birds dates back over a century to the times of Sir Brian Hodgson, who was British resident there. The opportunity to learn more of its avifauna was too good to miss, and the costs of a three-month trip on behalf of the Museum were assumed by Mr. Conover. (Mr. Conover died last month—*see page 2.*)

From Dr. Fleming's preliminary report we learn that a collection of some 700 bird skins was made during the three months spent in Nepal (November, 1949, through January, 1950). His glowing letters tell of climbing to 15,000 feet among the towering Himalayas, of travels by elephant in the tropical valleys and bird shooting from elephant-back, of his cordial reception by the administration, and of the friendliness of the people. We gain the impression of an outstanding success. The Museum collection will be notably augmented by the birds obtained by Dr. Fleming. Further report of the Nepal Expedition will be made on arrival of the collections. —A.L.R.

ECONOMIC GEOLOGY FIELD TRIP

The Museum's 1950 Mississippi Valley Field Trip left Chicago early in May. Robert K. Wyant, Curator of Economic Geology, is in charge. Collections of the ores from three lead and zinc mining areas of the Mississippi River Valley will be made. The areas and their features are as follows:

I. *Wisconsin-Iowa-Illinois District:* Lead and zinc mining activity has been partially rejuvenated in this area by recent geological investigations.

II. *Southeastern Missouri Lead Belt:* Located in the Flat River area, this belt contains one of the most important lead deposits in the world.

III. *Southeastern Illinois:* A new zinc-producing area is adjacent to the important Illinois fluorite deposits.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

One of the many skills of Carl E. Akeley in the fine art of taxidermy was his exceptional talent for mounting horned and short-haired animals by means of his sculptural method. His artist's observation of the anatomy of these beasts is clearly shown in the life-like mounts of the Swayne's harte-

SWAYNE'S HARTEBEEST
On exhibition in Carl E. Akeley Memorial Hall.

beest, now on exhibition in the hall commemorated to him. (After fifty years of progress in taxidermy, visitors and preparators still comment on the skill with which Akeley caught the facial expression of these somewhat grotesque antelopes.)

MALARIA MOSQUITO—

(*Continued from page 5*)

species ordinarily will feed on the blood of a wide variety of animals but may have definite preferences. Those that prefer the blood of animals other than man are called *zoophilic;* species that prefer the blood of man are called *anthropophilic.* Naturally, there are all degrees of anthropophily and zoophily. *Anopheles gambiae*, an African species that probably is the most dangerous carrier of malaria in the world, is a species that almost always feeds on the blood of man in preference to that of other animals. Male mosquitoes, of course, feed on plant juices and never take a blood meal.

It is not likely that adult anopheles live longer than a couple of weeks, on the average. In the temperate zones, some species are known to live over the winter as adults; this is true for only a relatively few individuals of the species involved. The duration of the early stages varies, depending upon factors such as temperature, food supply, and species characteristics. On the whole, species that breed in special niches such as treeholes undergo a longer period of development than do those that live in swamps and ponds.

A couple of hundred species of anopheles are known to science. Although experiments show that probably all or nearly all of them are capable of harboring and transmitting the parasites of human malaria, nevertheless only about two dozen species seem to be of any real importance in this respect. The place of man on an anopheles "food preference list" may be very important in determining whether or not that mosquito will be a dangerous malaria carrier. On the other hand, a species that rates man very low may be so abundant in the vicinity of humans that it still may be an important carrier. Flight range and breeding habits may also be important.

A very interesting factor, which is little understood, is the degree of compatibility between mosquito and parasite. Some anopheles are refractory to infection by the plasmodia so that only a small percentage of individuals may become infected at all, and an even smaller percentage may become sufficiently heavily infected to insure transmission to humans. In some cases a particular anopheles may vary in its refractoriness to different species of malaria parasites or to different strains of the same species. Obviously the above are only a few of the many factors that determine the effectiveness of an anopheles as a malaria mosquito.

STAFF NOTES

Dr. B. E. Dahlgren, Curator Emeritus of Botany, and **Dr. Hugh C. Cutler,** Curator of Economic Botany, have returned to the Museum from the Cuba Botanical Expedition .... **Dr. José Cuatrecasas,** Curator of Colombian Botany, has been appointed Corresponding Member of the Ecuadorian Institute of Natural Sciences (E. Instituto Ecuatoriano de Ciencias Naturales).

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

From: Dr. Paul C. Silva, Berkeley, Calif.—14 specimens of algae, California and Lower California; Dr. Hugh C. Cutler, Chicago—73 cryptogams; Donald Richards, Chicago—50 specimens of fungi and 284 cryptogams.

Department of Zoology:

From: Harry Hoogstraal, Chicago—255 bird skins, Africa; Chicago Zoological Society, Brookfield, Ill.—2 mammals and 21 birds; Dr. Harald Sioli, Belem, Brazil—131 specimens of land and fresh-water shells, Brazil; Nancy Traylor, Winnetka, Ill.—a bird skin, Illinois; A. R. Main, Nedlands, Australia—a lizard, Australia; Laura Brodie, Chicago—a cottontail rabbit skeleton, South Carolina; Dr. Jeanne S. Schwengel, Greenwich, Conn.—47 specimens of limpet shells; Ronald Goldman, Chicago—16 bats (*Myotis*) Missouri.

LECTURE TOURS IN JUNE DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Fri., June 2—Best Foot Forward—Footgear around the World. Illustrated introduction in meeting room (*Harriet Smith*).

Wed., June 7—What to Wear—Unusual Materials Used in Clothing (*Marie Svoboda*).

Fri., June 9—What's in a Name—Misnomers in Natural History. Illustrated introduction in meeting room (*June Buchwald*).

Wed., June 14—Origins of Modern Dress (*June Buchwald*).

Fri., June 16—On the Rocks. Illustrated introduction in meeting room (*Anne Stromquist*).

Wed., June 21—Fragrant Plants—Perfumes, Spices, Incense (*Miriam Wood*).

Fri., June 23—Animals of Fable and Legend. Illustrated introduction in meeting room (*Lorain Farmer*).

Wed., June 28—Wisdom of the Wild—Special Habits of Animals (*Jane Sharpe*).

Fri., June 30—Summer Hobbies—Exploring the Out-of-Doors. Illustrated introduction in meeting room (*Miriam Wood*).

Persons wishing to participate should apply at North Entrance. Tours are free.

NEW MEMBERS

The following persons became Museum Members between April 17 and May 15:

Associate Members

Mrs. Walter H. Jacobs, Glen A. Lloyd

Annual Members

William U. Bardwell, Myron M. Bennett, Eugene P. Berg, Mrs. Paul H. Bonfield, Mrs. Edward Earle Brice, David Dunning Brown, Miss Mary H. Burris, Alfred J. Cilella, Harry W. Clemenson, Roger W. Doderlein, Ralph O. Earlandson, Richard C. Frasier, L. Rene Gaiennie, Miss Blanche Gardner, Robert L. Grinnell, Thomas H. Hargreaves, W. C. Havelaar, Master Jonathan T. Howe, Sidney R. Johnson, Sievert Klefstad, John F. Mercer, C. H. Michael, Oscar W. Olsen, Miss Agnes M. Pearson, Alf F. Reid, P. F. Ryan, Harry H. Schraeder, Edward A. Slindee, Professor Julian J. Steen, Mrs. Florence S. Thompson, Edwin H. Wendt, Walter W. Wenholz, Hubert J. Wolfe.

Detroit Newsboys Visit Museum

Two hundred *Detroit Times* carrier boys visited the Museum recently.

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Chicago Natural History Museum

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

HENRY W. NICHOLS, 1866–1950

The long and productive career of Henry Windsor Nichols came to an end peacefully on June 11, 1950. He was eighty-three years old. Surviving are his widow, Anna L. (Giles) Nichols, and a sister, Caroline Richards Nichols. It was his wife whose devotion and care brought him through the trying years when the load of his official duties increased and his health failed. Before his retirement in 1944, Mr. Nichols had served the Museum faithfully for a full half-century. He was successively Assistant Curator, Associate Curator, Curator, and Chief Curator of the Department of Geology.

HENRY W. NICHOLS

Mr. Nichols, son of the late Levi Lincoln and Ellen H. (Tower) Nichols, came from a pioneer New England stock. He was born on December 7, 1866, in Cohasset, Massachusetts, where his early interest in geology was fostered by his rambles over its rocky shores. Like a true New Englander, he was reticent about personal reminiscences. Seldom, if ever, did he make any reference to his early days, and none of his colleagues had any knowledge of his life in this period.

In 1889, he entered Massachusetts Institute of Technology, graduating with distinction in physical sciences with the class of 1893. After graduation, while teaching geology at his alma mater, he was called to the Museum, then known as the Field Columbian Museum, to fill a vacancy in the Department of Geology. This was in 1894, the same year that the Museum opened its doors to the public. Thus, with the passing of Mr. Nichols, the Museum not only lost its oldest staff member but one who had seen and taken an active part in the stupendous growth that had taken place since its inception.

Soon after his appointment, Mr. Nichols made a survey of the collection in economic geology then on hand. Finding it unbalanced for a systematic display and inadequate for study and realizing that the progress of the infant Department largely depended on field work and research, he prepared a long-range program for both and conducted some sixteen expeditions in North and South America, collecting a wide variety of material for study and exhibition. His last expedition was to the Zuni Mountains in New Mexico, where he went in 1929 to secure volcanic specimens for a case in physical geology, then being installed. His last papers, "Chemistry in Field Museum" and "The Benld Meteorite," were published in 1939, when he was seventy-three years old.

On the thirtieth anniversary of his graduation with the class of 1893, he wrote to his alma mater: "Since coming here, I have been steadily occupied in building up a collection of ores and useful minerals, attempting to devise better means of exhibition than have been heretofore employed, with the object of securing, if possible, the most useful and instructive exhibits of this kind in existence. Some opportunity for research has presented itself, and in this line, I have made detailed study of the ores and some of the rocks of Colombia; of the nature of concretions; of the origin of nitrates in cave earths; and have made chemical analyses of numerous meteorites. I have made trips, usually of several months' duration, through the South Appalachian Mountains, the mountains of Arkansas, the lower Mississippi Valley, and parts of Wyoming and the Black Hills to study the ores and mining conditions there and to collect specimens. My amusement I take in a little gasolene launch on the Calumet River."

Although primarily an economic geologist, his interest in analytical chemistry was deep and absorbing. He had a superb grasp and a most thorough understanding of the fundamentals and principles of the subject. It is not generally known that practically all of the chemical calculations and all of the analyses of meteorites contained in the numerous publications of his predecessor, the late Dr. Oliver Cummings Farrington, were the work of Mr. Nichols. Yet, but for a casual mention here and there, "Analysis by H. W. Nichols," his name rarely appeared in the pages of the publications. It was not that Dr. Farrington was reluctant to give Mr. Nichols the credit due him; it was Mr. Nichols who stubbornly refused to accept it.

That a professional man would refuse recognition for his years of labor is most unusual, but Mr. Nichols was a most unusual man and a brilliant man. Not only was he a brilliant man with a fund of knowledge that was encyclopedic and with peculiarities that are prerogatives of brilliant men; he was also a kind and, indeed, a very generous man. His entire life was marked by utter simplicity and saintly honesty. He asked little of life and lived quietly, almost in obscurity, with good will to all, following the simple tenor of his ways.

SHARAT K. ROY
Chief Curator of Geology

THIS MONTH'S COVER

Henry Ward Beecher is said to have once remarked that if men wore feathers and wings a very few of them would be clever enough to be crows. The two young crows in the picture on this month's BULLETIN cover are not long out of the nest. The world lies before them. Blessed with native intelligence that is second to none in the bird world, young crows will profit from their own trial-and-error learning and from the example of their parents. Whether they will turn into good or bad citizens of the bird world, ornithologists do not agree. Some, pointing to the grain they may eat and the bird nests they may rob, will say they'll be bad. Others, pointing to the fact that much of the grain they will eat is waste grain and to the notable amounts of destructive insects they will devour, will say they'll be good. Probably the truth lies in between. Though the crow is black in plumage, his character is gray, with some black and some white in it. In any case, an old crow is a wise old bird, well able to take care of himself and get along without, nay in spite of, man's influence. The photograph, made by Carl Mansfield, of Bloomingdale, Ohio, was exhibited this year at the Museum in the Fifth Chicago International Nature Photography Exhibition held in co-operation with the Nature Camera Club of Chicago. —A.L.R.

HAWTHORNS BEAUTIFUL BUT A HEADACHE TO TAXONOMISTS

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

The hawthorns are conspicuous and showy native shrubs and small trees that dot the United States landscape, especially that of the eastern half of the country. Their habit of growth—low in stature, with dense foliage and branches massed together into a rounded or globular form—at once suggests the rounded low mimosa trees and bushes of some of the big-game country and veldt of South Africa. During spring and early summer showy masses of white, pink, or crimson-colored clusters of flowers cover all parts of the plant and give it a highly ornamental aspect.

While exceedingly attractive and commonly planted for their showy flowers and distinctive habit of growth, the hawthorns as a group are notorious as probably the most difficult among flowering plants to classify. When presented with a specimen for naming, most plant taxonomists are glad to render their services. But let a specimen of a hawthorn reach their hands! The unfortunate taxonomist, if he is at all honest about it, will admit that he is unable to name the specimen with any certainty. For the genus *Crataegus*, or hawthorn, comprises nearly a thousand named species. How many of these are distinct and valid as such is questionable. At the present time no botanist can definitely state that total.

HAWTHORN ON MUSEUM LAWN

A decorative group of Paul's double scarlet variety (Crataegus Oxyacantha var. Paulii). Note low, round, symmetrical form, with dense foliage and crowded branches.

HUNDREDS NAMED

At first a relatively small number of native species were described and recognized in the United States. As time went on and new workers became interested in the American hawthorns, many new species were described. In time, the late Professor Charles Sprague Sargent took a special interest in the group and gave new names to hundreds of hawthorns previously not recognized as distinct. At this point the situation became so critical and confused that other botanists, not having given the group special attention and study, were unable to place any confidence in the newly named species. Ernest J. Palmer, for many years a student of the genus, associated with Professor Sargent at the Arnold Arboretum, has devoted considerable time to the study of this group of plants. The results of his work, to be published shortly, will present the latest views to be expressed on the genus. For one thing, Mr. Palmer has not been able to recognize as many species as did Professor Sargent and thus has considerably reduced the total number of supposed species.

In the United States the hawthorns are especially abundant and diversified in regions of limestone and rich soils, especially in parts of the eastern and middle-western states. They are found in the temperate regions of the northern hemisphere, but are most abundant and reach their highest degree of variation in the eastern half of the United States.

One of the showiest and most ornamental of hawthorns is a commonly cultivated one known as Paul's double scarlet (*Crataegus Oxyacantha* var. *Paulii*). The ordinary form of the species (*Crataegus Oxyacantha*) has white or pinkish single flowers with normal development of stamens. But in Paul's double scarlet hawthorn, although the petals themselves are rose-red in color, the stamens, instead of having the normal golden anthers and filaments, have developed into what resembles petals. The result is a flower that resembles a tiny rose in both form and color. When these double flowers (the term "double" applying to flowers in which most or all of the stamens have become petaloid) are aggregated into dense clusters, with thousands of blossoms on a single tree, the color effect is both beautiful and striking.

FLOWERS OF HAWTHORN

Close-up view of flowering branch of Paul's double scarlet hawthorn. The showy rose-like flowers are deep rose-red in color.

ORNAMENTAL USE

Because of its unusual ornamental appearance, Paul's double scarlet hawthorn is frequently planted around homes and in parks. During late May and early June its showy masses of rose-colored flowers are resplendent in the Chicago region. The main shrub planting around Chicago Natural History Museum is dominated by this small tree, and during the time that it is in flower visitors to the Museum commonly inquire about the name of this spectacular plant.

Annual Report on Way

The Annual Report of the Director for the Year 1949 is now on the press and soon will be distributed to all Members of the Museum. Its publication has been delayed by priorities for various scientific publications that for months past have been taxing the capacities of the Museum press.

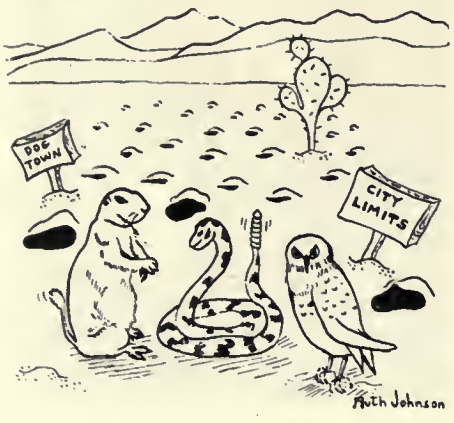
Everything in Nature contains all the powers of Nature. Everything is made of one hidden stuff. —*Emerson*

SYMBIOSIS—ANIMALS LIVING IN MIXED HOUSEHOLDS

By AUSTIN L. RAND
CURATOR OF BIRDS

SYMBIOSIS, a term from the Greek, is what the biologist uses to describe the living together of two dissimilar organisms. In a broad sense it includes such diverse relations as lice living on man and rats in his house, the union of an alga and a fungus to form a lichen, and the cross pollination of flowers by hummingbirds.

The story of the burrowing owls of our western plains living in amity with prairie dogs and rattlesnakes as one happy family



comes to mind as an example. But "foolish nonsense" is how the noted biographer of North American birds, A. C. Bent, characterizes such stories. He then goes on to quote evidence as to what actually happens, and one can see how the story originated.

The prairie dogs, which are really plump, dumpy ground squirrels and not dogs at all, dig their burrows close to each other on the prairie in colonies that have come to be called prairie-dog towns, or "dog-towns" or simply "towns." Burrowing owls also take up their residence in these towns, probably because they find burrows ready made and do not have to dig their own (as they are quite able to do).

MODERATELY PREDATORY

The owls may make an occasional meal of a young prairie dog and a prairie dog may perhaps dine occasionally on owl eggs, but, on the whole, owls and dogs get along on terms of easy familiarity. Sometimes, when alarmed, both may scuttle into the same burrow for safety, but each has its own burrow. With the rattlesnake it is different. The rattlesnake may live in burrows in the dog-town, but when it is hungry it eats owl or dog as occasion offers. While the picture of a happy family of owl, dog, and snake is a myth, the symbiosis of owl and dog, at least, in the same colony is striking.

In Africa there is a tiny falcon only about eight inches long, which is called the pygmy falcon. When Dr. Herbert Friedmann, of the United States National Museum, was studying the social weavers in South Africa, birds that nest in large colonies under a common roof made by themselves in a savanna tree, he found these falcons occupying nest chambers in thriving weaver colonies. There was no friction between the weaver birds and the falcons, and they were sometimes seen to sit side by side. When Friedmann collected three of these falcons he found bird remains in their stomachs, but the remains were not those of the social weavers. Apparently the falcons were feeding largely on small birds, but they did not molest the weaver birds, which had made the nests the falcons were using.

PARROT-DUCK-'POSSUM MENAGE

We occasionally find a mallard nesting in a tree on an old crow or hawk nest, and there are ducks like the wood duck and the golden-eye that usually nest in holes in trees. It is more remarkable that a South American duck known as the tree teal habitually nests in a parrot's nest. The parrots, called monk parakeets, make their nests in compact colonies in the branches of trees, so close together that they form a single mass. The tree teal's usual manner of nesting is to lay its eggs in one of the chambers in this apartment-house colony. At first the eggs are laid on the rough twig floor of the nest, but as the eggs increase in number a lining of down, plucked from the breast of the bird, is added until it may even extend out through the entrance of the nest. Apparently parrot and duck both get along amicably in their pendant tree-top cradles. An opossum sometimes finds these parrot nests to its liking, though one wonders if it may not have a meal of young parrot or duck in mind. But be that as it may, in different chambers of a single communal nest of these parrots, a duck and an opossum as well as parrots have been found.

On islets off the New Zealand coast lives a rather large-sized lizard-like reptile, the tuatara (*Sphenodon*). It is rather well known by name at least, for it is one of those relics that are called living fossils because they are survivors of a formerly more widespread group. In the present connection we are interested in the fact that petrels swarm to these same islands to dig their burrows and lay their eggs in them, and it is in these same burrows that *Sphenodon* spends its daylight hours. Apparently the insect-eating *Sphenodon* and the ocean-feeding petrels share the burrows amicably.

Malacologists' Meeting

The American Malacological Union held its annual meeting in the Lecture Hall of the Museum on June 14, 15, and 16. Specialists in this field from all over the country attended. Dr. Fritz Haas, Curator of Lower Invertebrates at the Museum, was president of the organization.

A NATURALIST'S EXCURSION IN SPESSART FOREST

By KARL P. SCHMIDT*
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

The Natur-Museum of the Senckenbergische Naturforschende Gesellschaft in Frankfurt am Main corresponds in scope to the Departments of Geology and Zoology in Chicago Natural History Museum. Though the building was badly damaged by bombing in World War II, the collections and library had been stored during the war. With repaired roof and an active program of rebuilding, the museum has again opened most of its exhibition halls to the public, and the scientific collections are being unpacked and brought into order.

The prewar custom of an annual museum picnic, which had been of necessity suspended during the war and postwar economic stringencies, was resumed on May 20 this year in the form of an all-day "Ausflug," by omnibus, to the famous Spessart Forest, about 50 miles east of Frankfurt. The museum personnel, ranging from Director to night-watchman and janitress, with wives and older children, made up a party of fifty, including representation from the Board of Trustees. As newly appointed "Honorary Corresponding Member" I had the privilege of accompanying the group.

STRIP FARMING

Our route led through the farm land and farm villages along the Main river to the east and north, with repeated glimpses of the strip-agriculture characteristic of this part of Germany. Here the farm land has become subdivided and still more subdivided by inheritance, until the fields have become a patchwork of narrow rectangular strips, rarely with any two patches alike, planted to wheat, clover, oats, rape, and garden crops, and often with a row of fruit trees down the center. The owners of these strips of land live in villages usually much more than 500 years old, often with a thousand years of existence as communities behind them.

Most striking to an American is the stall-feeding of cattle, with the careful hoarding of manure, though the barns and stalls and manure piles are here more usually in the courtyard behind the houses than toward the street itself, as is so often the custom elsewhere in Europe. Novel to us also is the use of cows as draft animals, both for cultivation of the fields and for drawing wagons and carts.

As we left the flat and rich agricultural area along the Main, the low hills above us were crowned with forest, usually of beach or spruce in uniform stands but sometimes in mixture. The cultivated fields are carried

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* Chief Curator Schmidt is at Senckenberg Museum and University of Frankfort as a member of the University of Chicago faculty exchange team.

to a sharp boundary with the forests. As the road brought us into higher land the forest came more and more to predominate, though even when there is no longer plowland, narrow strips of meadow are carried along the bottom lands of every mountain streamlet into the forest. These little troutbrook meadows, with the dark forest on each side, provide landscapes of extraordinary charm.

RECALLS MIDDLE AGES

The Spessart Forest itself is in part an oak forest. The predominance of oak is interpreted as resulting from the favoring of the oaks by man during the Middle Ages for production of acorns, valued as food for the droves of swine that were in those days herded in the forest much as are sheep on more open land.

Led by the Chief Forester, we had a view of the well-kept 300-year-old stands of oak, with sometimes 40 or 50 feet of clear trunk, that are the pride of this forest. These oaks produce long, straight, and clear timbers and are of great value. A single one may bring hundreds and even thousands of dollars if it is suitable for furniture. Adjoining stands of timber have been set aside as nature reserves, and in these the largest oaks have been shown to be more than 600 years old. In these stands the oak is disappearing and being replaced by beech.

Here one may see and hear a variety of small forest birds whose numbers compare favorably with those of a hardwood forest in the Chicago region. Most memorable of all their voices are perhaps the unmistakable resounding call of the cuckoo and the deep notes of the wood pigeon, which are almost owl-like in quality. At the Chief Forester's establishment we saw a few captive wild pigs and learned that these have become a plague in the forest region, raiding the neighboring fields to such an extent that strong communal pig-tight fences have had to be put up around the villages.

The manager of a small iron works at the village of Laubach had invited the entire party to afternoon coffee in the workmen's community hall at the works. Mr. Dueker, our host, and his wife expressed themselves as endlessly indebted to the Senckenberg Museum for a large share of their education and regarded the entertainment of the museum personnel as a token of their gratitude. The bountiful coffee table with "Torten" and "Streuselkuchen" and endless cups of coffee was made still more "gemuetlich" by the workmen's small orchestra, for which Mr. Dueker himself played an organ accompaniment. Chairs were cleared away and the younger couples, with not a few of the older ones, joined in dancing.

REPTILES COLLECTED

Meanwhile, in the manager's auto, Director Mertens and I, with Mrs. Mertens and Miss Schirner, of the museum's reptile division, were whisked out to the head of one of the little mountain brooks, where a spring and dammed-up pool provided an unusually favorable station for amphibians and reptiles. Here we found (and collected for the museum in Chicago) seven species. The common European toad and the grass frog were both of interest for their relations with the Chinese frogs and toads recently studied in Chicago by our Research Associate Ch'eng-chao Liu.

There were larvae of the fire-salamander at the spring; and the pond yielded not only the abundant mountain newt but two specimens of the extremely interesting thread-tailed newt, which is more properly an Alpine creature. A blind worm (the common limbless lizard of Europe) and a water snake rounded out our unexpected museum booty.

Much of the interest of the trip lay in the frequent pauses at eating places, at a country "Wirtshaus" for second breakfast, with cold sausages and fresh rolls, a midday meal at the "Wirtshaus im Spessart," a name familiar in German literature from a book of stories with that title by Wilhelm Hauff, our surprise afternoon coffee at Laubach, and lastly a supper at Wasserloh, where huge pitchers of the local "national drink," apple cider, washed down the "Bratwurst." The final stretch of road in the dark was enlivened by group singing, and Frankfurt was reached by 11 o'clock, where we dispersed by train and streetcar to our homes. In such a communal picnic, not unlike our similar informal Department gatherings at home, we may see the roots of a genuine and native democratic spirit in Germany.

SUMMER LECTURE TOURS GIVEN TWICE A DAY

During July and August, conducted tours of the exhibits, under the guidance of staff lecturers, will be given on a special schedule, as follows:

Mondays: 11 A.M.—The Earth's Story (general survey of the geology exhibits); 2 P.M.—General Tour.

Tuesdays: 11 A.M.—The World of Plants (general survey of the plant exhibits); 2 P.M.—General Tour.

Wednesdays: 11 A.M.—The Animal Kingdom (general survey of the animal exhibits); 2 P.M.—General Tour.

Thursdays: 11 A.M. and 2 P.M.—General Tours.

Fridays: 11 A.M.—The Story of Man (general survey of the anthropology exhibits); 2 P.M.—General Tour.

There are no tours on Saturdays and Sundays, or on Monday and Tuesday, July 3 and July 4.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

"Through the generosity of Mr. W. J. Chalmers, funds were provided which enabled the department [Geology] to prepare a collection of crystals of the United States minerals for exhibition at the Paris Exposition. At the close of the exposition the collection will be returned to the Museum. It was awarded a silver medal."—*Annual Report of the Director, 1900.*

[*This collection may now be seen in Hall 34. The crystals have been reinstalled in a new type of case with fluorescent lighting, each mineral being mounted on an individual plastic base. The collection includes a comprehensive exhibit of the six main crystal systems.*]

* * *

"The increase in the attendance must be considered gratifying; the figures showing an increase of 43,595 over 1899 in the total attendance [266,899] for the year [1900]. The visit of the members of the Grand Army of the Republic [5,813] helped this to an extent. The Museum prepared a framed directory of the museums, galleries and libraries of the city, which has been hung in the different hotels and other public places for the guidance of visitors to Chicago. It has been noted especially during the summer just passed that a large number of people visiting the Museum were evidently strangers in the city, which leads one to the conclusion that the fame of the institution is spreading, and that it is now regarded as one of the points of attraction to those who are transient in the city."—*Annual Report of the Director, 1900.*

RARE FRENCH VOLUMES ON SCIENCE ACQUIRED

In announcing the completion of the Museum's Library holdings of the *Comptes Rendus* of the Academie des Sciences, Paris, grateful acknowledgement is made to the Permanent Secretaries of the Academie, through whose courtesy and generosity the 100 volumes were made available. The Library of the Museum has endeavored over a long period to secure the volumes lacking in its set, and their acquisition as a gift is indeed fortunate.

This important publication, covering the entire field of science in France, has become increasingly scarce and difficult to obtain. The numbers of the *Comptes Rendus* contributed by the Academie des Sciences, Paris, include Volumes 1 through 36, 45 through 105, and 121 through 123.

The history of science is science itself.
—*Goethe*

I LIVE IN HONDURAS

By PAUL C. STANDLEY
CURATOR OF THE HERBARIUM

For the greater part of the past two years I have lived in Central America, in Honduras. I like Honduras. Most people of the United States who have never been in tropical America have an erroneous idea of it. They believe that the tropics are as a matter of course hot, and some of them are. I do not live in that kind of tropics, and should not care to live there. People of the temperate United States also believe generally that in the tropics it rains almost every day. That rarely if ever is true. Actually, in central Honduras it rains half the year, but seldom harder than in Chicago, while in the other six months there is no rain at all. There are many similar misconceptions of the nature of tropical lands.

I have been extremely fortunate in having the opportunity to live in one of the parts of Central America that is ideal in many respects, at the Escuela Agrícola Panamericana (Pan-American Agricultural School), located at El Zamorano, about 25 miles east of the Honduran capital, Tegucigalpa. It is situated in the valley of the Río Yeguare, at an elevation of 2,600 feet, with intensely blue mountains forming the sides of the valley. The school was developed and is maintained by the United Fruit Company, producer of most of the bananas that reach the North. Its director is Dr. Wilson Popenoe, eminent horticulturist and botanist. All expenses of the school are paid by the United Fruit Company, and the students, at present nearly 180, are given scholarships that cover all expenses for the three-year course.

COLLECTING FOR MUSEUM

During the past twenty months I have been engaged in collecting and studying plants in middle Central America under the auspices of Chicago Natural History Museum, and the results have been highly satisfying. Only two countries have been visited during this Museum expedition, Honduras and Nicaragua, and most of the time has been spent in Honduras.

During the past year a few months were spent in Nicaragua, most of the time in the eastern rain forest at El Recreo and Bluefields. This large region, little populated, is unlike other parts of Central America in several respects. It is difficult of access except by plane, and within the area practically all transportation is by the large rivers that cross it. Most travel is in dugout canoes, which in spite of their apparent lack of reliability carry the most various kinds of articles long distances to and from the coast towns. While I was at El Recreo, the most common cargoes happened to be watermelons. This area is remarkable also for its great abundance of birds, especially toucans. One afternoon on the road to Chontales (which is passable only in the very brief dry season) there were thousands of large toucans visible at one time, almost every tree being filled with them, perched high on the branches.

Plant collecting was successful about both El Recreo, on the Río Mico, and Bluefields, the port of Atlantic Nicaragua and a most unusually attractive city for the Atlantic coast of Central America, where most towns are anything but delectable. Little botanical work has been done in eastern Nicaragua or, in fact, in the whole country.

After returning to the "interior," as the Pacific slope of Nicaragua often is called, collecting was done first around Estelí at the beginning of the rainy season. The Estelí region, like numerous other parts of Nicaragua, is noted for its deep, heavy, black soil, often overgrown with calabash trees, which becomes a quagmire as soon as the rains start. On account of this, oxen and bulls are used during the wet months as riding animals, something unknown elsewhere in Central America. Estelí is arid in the dry months. The trees lose their leaves during the prolonged dry period, but with the advent of the rains they put forth bright new leaves that give the woods much the appearance of a forest of the United States in spring.

STRANGE LOCAL PASTIME

After leaving this place, only a short time was passed collecting about Condega, also in western Nicaragua. This small town was visited by Thomas Belt and described in his classic work, *The Naturalist in Nicaragua*, one of the best books ever published about Central America. Condega is famous for a unique festival celebrated there each year. During the preceding months all sorts of wild animals—mammals, birds, and snakes—are taken alive and during the *feria* are exhibited in cages. At this time some of the animals, at least the snakes, are tortured and finally burned alive. The rather conspicuous cruelty to animals observed here probably has its origin in this celebration, which almost certainly descends from some ancient pagan custom of the locality.

During my residence in Honduras I visited all but one of the departments. In several of them no botanical collections had been made previously. Particularly attractive and botanically interesting was Olancho, a department larger than either El Salvador or Costa Rica. Until the development of air travel, which has progressed far in Honduras because of the poor highways, Olancho was isolated and the people had little contact with other parts of the country. Now, in a plane, the journey that required three days or more by horseback may be made in forty minutes.

Because of its isolation, Olancho has retained many customs and traits of colonial days. Even the Spanish spoken shows many localisms, although this is not particularly unusual in Central America. The *olanchanos* are noted also for the clarity of their speech. The region is devoted largely to the production of horses, mules, and cattle. Much gold has been obtained from the rivers, and some still is being washed there.

From Juticalpa I moved to Catacamas in the same department, which was found to be rich in plants, especially on the steep slopes of the almost completely forested high peak that rises above the town. It was strange to find on these slopes, far from either coast, the same flora that characterizes the rain forest of the Atlantic lowlands. Peculiarly interesting was the abundance of black walnut trees along the small near-by river and well up on the mountain slopes. Never have I seen so many walnut trees in other areas of Central America. Ferns, too, abounded with many species, and along the stream banks were beautiful displays of pink-flowered begonias —one of them six feet tall or more—forming dense, pure stands.

STRIPED PIGLETS

Among the curious things observed in this part of Honduras were striped piglets, which I later saw, but in much reduced numbers, elsewhere in Honduras. About half the pigs born in this part of Olancho have conspicuous black longitudinal stripes, which disappear after one or two months, evidently an inheritance from some remote ancestor. I also saw some "zebra" horses, which were not such attractive animals as the little pigs. These horses are not too conspicuous and certainly not handsome. The two I saw one day had very fine vertical striping of sorrel or almost bay and white, which gave the effect of a corded fabric.

Of botanical curiosities there is true popcorn, which is much like that of the United States and pops almost equally well. True popcorn and sweet corn are exceedingly rare in Central America. Olancho, too, is noted for its palm wine, which was in season in March when I was there. Tall coyol palm trees are cut, the spiny leaves removed, and the trunks dragged to some central location and laid on the ground. A trough is cut along the upper side and covered with leaves. In a short while the trough is filled with the clear "wine," which is a favorite beverage with most people who know it. Slightly fermented when ready to drink, it would be much better if not heated by the sun, as usually it is.

A short but profitable trip was made at the harvest season to the town of Pespire, near the Pacific coast of Honduras, and from there to the little village of San Antonio de Padua, perched high on a shelf of a mountain side. It had been reported that there grew wild at this locality the grass usually called teosinte, the only wild grass closely related to maize. This trip was made to verify the occurrence of the puzzling

plant, which was unknown previously in the wild south of Guatemala.

Other trips in Honduras of varying length were to San Marcos de Colón near the Nicaraguan frontier, Choluteca, in the same department but at low elevation, to Danlí, a delightful town also near the Nicaraguan border, to Comayagua, former capital of both Honduras and Central America, to the department of La Paz near by, and to Intibucá and Santa Rosa Copán (this is a quite different place from the famous Maya ruins of Copán).

STAFF NOTES

Gustaf Dalstrom, Artist in the Department of Anthropology, has been commissioned to paint a mural of the meteor crater in Arizona for Adler Planetarium. The work is being done in addition to his usual duties at this Museum. He was sent for a few days by the Planetarium authorities via air to Arizona to make sketches and aerial photographs .... **Colin C. Sanborn,** Curator of Mammals, last month attended the meetings of the American Society of Mammalogists at Yellowstone National Park .... **Clifford H. Pope,** Curator of Amphibians and Reptiles, is spending five weeks at the Museum of Comparative Zoology, Harvard University, where he is engaged in studies on African snakes .... **Harry E. Changnon,** Curator of Exhibits in Geology, **Robert K. Wyant,** Curator of Economic Geology, and **Eugene S. Richardson, Jr.,** Curator of Fossil Invertebrates, attended technical sessions of the American Association of Petroleum Geologists and affiliated societies that recently met in Chicago .... **Dr. Austin L. Rand,** Curator of Birds, recently spoke over radio station WJJD on "Bird Nests."... **Colin C. Sanborn,** Curator of Mammals, attended a meeting of the 5th Army Insect and Rodent Control Training Course at Fort Sheridan. **Rupert L. Wenzel,** Assistant Curator of Insects, also spoke before the meeting .... **Dr. Theodor Just,** Chief Curator of Botany, presented a paper on "Mesozoic Plant Microfossils and Their Geological Significance" at the symposium on applied paleobotany held as part of the recent program of the Society of Economic Paleobotanists and Mineralogists in Chicago.

STORIES IN HAIR AND FUR

During the month of August and the first twenty days of September, a period when many women by a strange anachronism think about winter furs and shop for them, the Museum will display in Stanley Field Hall a special exhibit on the subject prepared by the Cranbrook Institute of Science. By means of specimens, some of which may be handled, photographs, and drawings, the 30 panels comprising the exhibit will give much enlightening information on the commercial treatment and uses of fur and hair. The exhibit is calculated to be of great general interest as well as of particular value to prospective purchasers of furs and those concerned with the economic aspects of the fur industry.

BERMUDA ZOOLOGICAL EXPEDITION

The 1950 Bermuda Zoological Expedition will leave July 5 for undersea work from the Bermuda Biological Station for Research, Inc., on St. George's. Dr. Fritz Haas, Curator of Lower Invertebrates, will be the leader of the expedition, assisted by Joseph B. Krstolich, Artist in the Department of Zoology. Collecting and research will be conducted for a period of about two months. Dr. Haas will concentrate on the scientific angles, and Mr. Krstolich will do the technical work. Mr. Krstolich, provided with boats and complete diving equipment, will spend considerable time making undersea color photographs and color notes for a proposed habitat group showing coral formations as they appear under the water.

Invertebrate Fossil Collecting

Eugene S. Richardson, Jr., Curator of Fossil Invertebrates, will leave Chicago on July 20 to collect fossils from several important localities in western Wyoming and southeastern Idaho.

NEW MEMBERS

The following persons became Museum Members between May 16 and June 15:

Benefactors

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Contributors

Emil Eitel*

Associate Members

Egington Franklin, Adolf Marx, Ross D. Siragusa.

Sustaining Members

D. H. Wilson

Annual Members

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* Deceased

LOUIS B. BISHOP, 1865–1950

Dr. Louis B. Bishop, Research Associate of the Museum since 1939, died in his 85th year, at Pasadena, California, on April 3, 1950. Dr. Bishop was given the honorary appointment on the staff of the Museum as Research Associate in the Division of Birds when the Museum acquired from him "The Bishop Collection" of birds.

LOUIS B. BISHOP

Dr. Bishop was born in New Haven, Connecticut, June 5, 1865. He was graduated from Yale University and continued studies in medicine in the special field of pediatrics that he expected to follow professionally. However, his interest in birds led him to spend his life studying them and assembling the Bishop Collection. His expeditions took him to eastern Canada, the Middle West, to Yukon and Alaska. In these last areas he traveled with Dr. Wilfred H. Osgood, late Chief Curator of Zoology of the Museum. In addition, Dr. Bishop had collectors in the field from Alaska to Mexico.

The Bishop Collection was assembled in the period when large private collections, such as this and the William Brewster Collection, now in the Museum of Comparative Zoology, Cambridge, Massachusetts, and the Jonathan Dwight Collection, now in the American Museum of Natural History, New York, rivaled in importance those of public institutions. The Bishop Collection totaled more than 50,000 birds, representing nearly all the known North American birds north of Mexico, and included in it were at least 19 type specimens and 33 skins of extinct birds. With its acquisition Chicago Natural History Museum became one of the important centers for material on which the research on the evolution and variation of North American birds was based. After the Bishop Collection came to Chicago, Dr. Bishop, though residing in California, continued to work on material he had retained for study and to have collectors add to it, so that we continued to receive material from him up until the present.

With his passing is gone one of the last links with the old school of ornithologists, the men of the 19th century, many of whom studied medicine as their scientific training, who did much of the pioneer work of classifying and arranging the discoveries of the preceding era. They were the workers who presented the first comprehensive picture of the variation and distribution of North American birds.

AUSTIN L. RAND
Curator of Birds

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

HUMAN ECOLOGY: A Theory of Community Structure. By Amos H. Hawley. The Ronald Press Company, New York, 1950. xvi+456 pages, 44 figures, 58 tables. Price $5.

Ecology is the systematic study of the interrelation between plants and animals and their physical and biotic environment (i.e., climate, soil, topography, and other plants and animals). The unit of study in ecology is the community, which is the plant-animal population of a particular time and place (locality or region). The growth during the past thirty years of the special field of human ecology, which may be defined as the study of the spatial patterns, form, and development of the community in human population, "has meant a logical extension of the system of thought and techniques of investigation developed in the study of the collective life of lower organisms to the study of man." Professor Hawley's book is a review of this development and a survey of the body of data and concepts that comprise the field of human ecology.

The author, who is a sociologist, believes that the principles of general ecology can be applied fruitfully to man because "human behavior in all its complexity, is but a further manifestation of the tremendous potential for adjustment inherent in organic life" and "the difference between man and other forms of life is a matter of degree rather than of kind . . ." He recognizes the importance of culture but asserts that this factor merely increases the complexity of organization but does not alter the general principles of ecological adjustment. Some other human ecologists feel that man's development of culture and his symbolic capacity (language, communication), by giving him enormous adaptability and power to alter his environment, set him apart from other organisms and create special problems in human ecology. Anthropologists support the importance of this distinction.

Although anthropologists, geographers, students of population, and economic historians have long been interested in problems of human ecology, the recent and systematic development of the field has taken place in sociology. The concern has been primarily with the forms and development of community organization among Euro-American peoples and particularly in the city. A mass of data has been collected and analyzed concerning community interrelationships, ecological zones, and ecological succession within the metropolis. Although human ecologists are "hampered by persistent disagreements concerning the nature of their data and the techniques of study amenable to them," the field has already produced results of practical value in the prediction of community and regional change. Such bodies as the National Resources Planning Board and the various city-planning commissions constantly make use of the concepts and data of human ecology, and as the data and concepts of human ecology are refined and systematized, city and regional planning will become more effective.

This is not an easy or light book, but the wealth of material on Chicago concerning ecological zones, the growth and shifting of neighborhoods, and the vastly complex interrelationships within the metropolitan area should make it fascinating and instructive for any Chicagoan who is interested in the history and functioning of his city.

DONALD COLLIER
Curator, South American Ethnology and Archaeology

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received recently:

Department of Botany:

From: Donald Richards, Chicago—424 herbarium specimens, Finnish Lapland; E. J. Richards, Chicago—500 specimens of mosses, Czechoslovakia; Isabel Kelly, Mexico City—55 economic specimens of legume and Cucurbit, Mexico; Oliver Norvell, Stanford, Calif.—58 economic specimens of legume and Cucurbit, Mexico and southwestern United States; Burpee Seed Co., Philadelphia—81 economic specimens of legume seeds.

From: Dr. Warren Morrison, Chicago—2 specimens of Chondria, Florida; Dr. L. J. Gier, Liberty, Mo.—3 specimens of algae, Missouri; Dr. Walter Kiener, Lincoln, Neb.—159 specimens of algae, chiefly Nebraska; Ralph A. Lewin, New Haven, Conn.—3 specimens of algae; Dr. John L. Blum, Buffalo, N.Y.—153 specimens of algae, New York; Dr. H. B. S. Womersley, Adelaide, Australia—3 specimens of algae, northern Australia; Dr. Harold A. Senn, Ottawa, Canada—18 specimens of algae, arctic Canada; Dr. Alton A. Lindsay, Lafayette, Ind.—3 specimens of algae, New Mexico; School of Forestry, Yale University, New Haven, Conn.—28 herbarium specimens, Brazil.

Department of Zoology:

From: Chicago Zoological Society, Brookfield, Ill.—4 mammals; Dr. Jeanne S. Schwengel, Greenwich, Conn.—27 marine shells and 117 specimens of gastropods of the family *Trochidae*, including 2 paratypes; Ronald Goldman, Chicago—2 bats, Missouri; the late Boardman Conover, Chicago—81 bird skins, Perry River region in Arctic Canada; Dr. Clifford O. Berg, Delaware, Ohio—about 40 specimens of water mites, Michigan; John G. Shedd Aquarium, Chicago—a fish, Florida; Dr. Hans Elias, Chicago—5 marine eels, Florida; Companhia de Diamantes de Angola, Porto, Portugal—100 bats, Angola, Africa; Leon R. Aboulafia, Tel-Aviv, Israel—a weasel, Israel; Richard Flohr—a trigger fish, Florida; Herbert Stoddard, Sr., Thomasville, Ga.—2 young quail, Georgia; Susan Carpenter, Chicago—a tube of an annelid worm, Florida; A. J. Gorges, Eagleton, Ark.—a lizard, a turtle, and 3 snakes, Arkansas; Charles Reynolds and Leroy Williams, Eagleton, Ark.—a snake, Arkansas; Bert Windham, Eagleton, Ark.—a snake, Arkansas; Daniel G. Henson, Jr., Eagleton, Ark.—a snake, Arkansas; Dr. Kenneth W. Cooper, Princeton, N.J.—320 insects, United States and Central America; Leslie Hubricht, Danville, Va.—2 salamanders, Virginia.

Library:

From: Col. Clifford C. Gregg, Valparaiso, Ind.; Karl P. Schmidt, Homewood, Ill.; Stewart J. Walpole, Mount Dora, Fla.; Academie des Sciences, Paris; Eugene S. Richardson, Jr., Winnetka, Ill.; George Langford, Lillian A. Ross, Mary Bostwick Day, Paul C. Standley, and Dr. Fritz Haas, all of Chicago.

MOVIES FOR CHILDREN IN JULY AND AUGUST

The annual summer series of free motion-picture programs for children will be given by the Raymond Foundation on Thursday mornings during July and August, beginning July 6. There will be two performances of each program, the first at 10:30 A.M. and the second at 11:30 A.M.

The entertainments will be given in the James Simpson Theatre of the Museum. Children are invited to come alone, accompanied by parents or other adults, or in groups from clubs and various centers. Admission is free. Following are the dates and titles of the films:

July 6—ELEPHANT BOY
Sabu, the elephant boy, in a story based on Kipling's "Toomai of the Elephants"
(This program runs longer than normal and the second showing will start about 11:45 A.M.*)*

July 13—EXPLORING THE WOODLANDS
Also a cartoon

July 20—EL NAVAJO
Daily life of the Navajo Indians
Also a cartoon

July 27—WONDERS IN THE COUNTRY
Also a cartoon

August 3—BEYOND BENGAL
An expedition into the Malay jungles
(This program runs longer than normal and the second showing will start about 11:45 A.M.*)*

August 10—ADVENTURES OF CHICO
Story of a little Mexican boy

PRINTED BY CHICAGO NATURAL HISTORY MUSEUM PRESS

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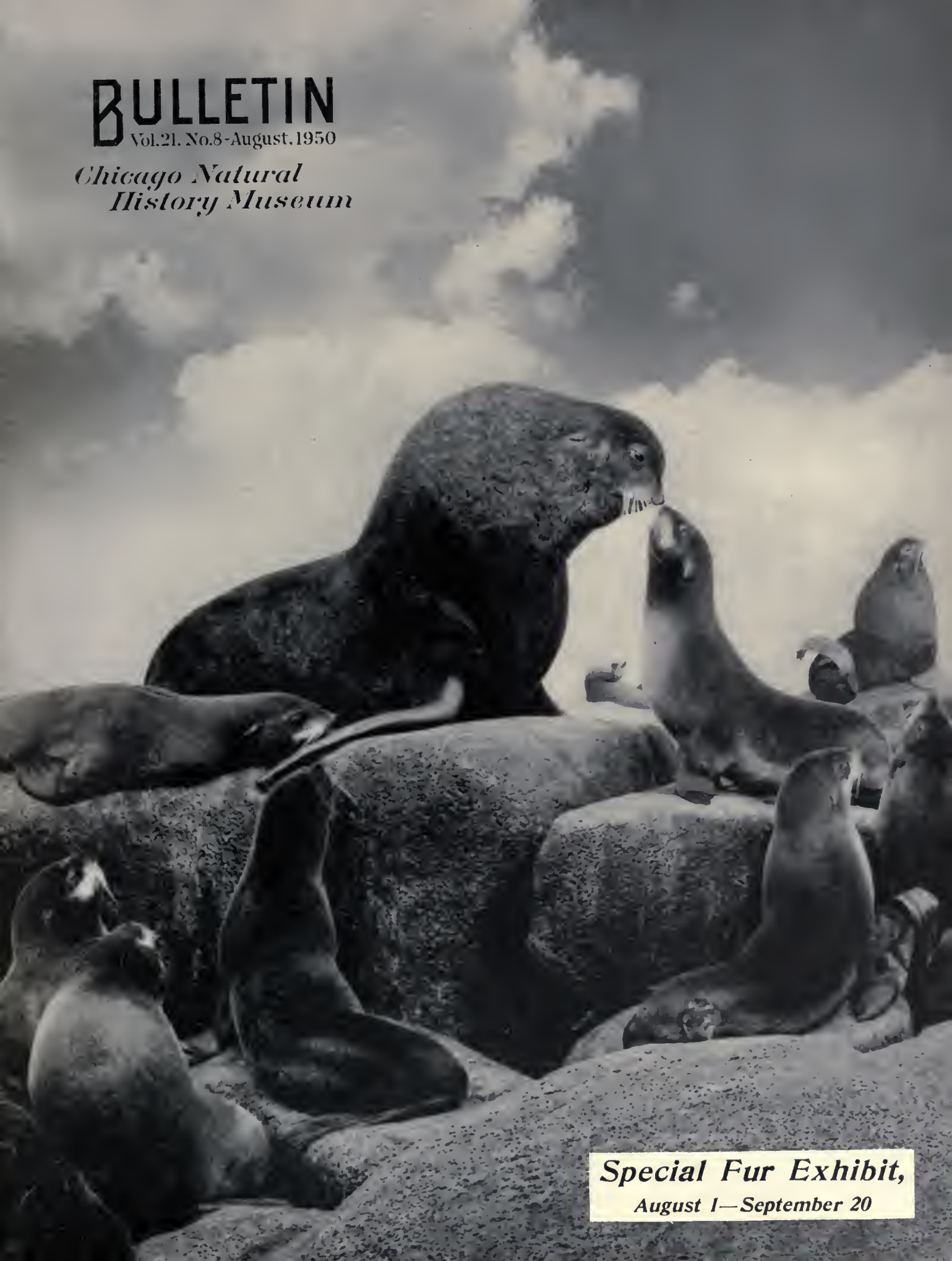

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Members are requested to inform the Museum promptly of changes of address.

'EARLY AMERICAN' PEACE

To many, "early American" suggests gate-legged tables and ladder-backed chairs. For a group of experts from the Chicago Natural History Museum, the phrase is associated with the Mogollon people, who lived in North America from ancient Egyptian times to the days of the Anglo-Saxon kings.

Dr. Paul S. Martin is now in western New Mexico on another of his numerous expeditions for the Museum to unearth facts about this tribe. Much credit is due to the Museum for sponsoring the work, and to Dr. Martin and his associates for the perseverance and insight with which they have been working fruitfully for years, reconstructing the story of prehistoric Americans.

An abundance of facts about prehistoric man may give modern man timely clues indicating how and why human societies flourish or die. The Mogollon people are particularly intriguing as civilization wrestles with the task of preventing World War III. The evidence tells us that they lived thousands of years without warfare.

From Chicago Daily News, July 24, 1950

Museum to Be Host in 1951 to Scientific Societies

The American Society of Mammalogists at its annual meeting in Yellowstone National Park in June voted to accept the invitation of Chicago Natural History Museum to hold its 1951 meeting here. The American Society of Ichthyologists and Herpetologists at its annual meeting in Salt Lake City also accepted the Museum's invitation and will meet with the American Society of Mammalogists. The date for the meetings will be decided upon later. It is ten and eleven years respectively since these societies met in Chicago.

STAFF NOTES

Dr. Sharat K. Roy, Chief Curator of Geology, will leave in August to engage in field work for several weeks in western New York state. He also will visit several eastern museums to study and to facilitate exchanges of meteorites.... **Harry E. Changnon,** Curator of Exhibits, will spend one week in August studying at museums in Ann Arbor and Bloomfield Hills, Michigan, and Springfield, Illinois.... **Colin C. Sanborn,** Curator of Mammals, has been elected a director of the American Society of Mammalogists, which will hold its 1951 meeting in Chicago.... **Dr. Theodor Just,** Chief Curator of Botany, has accepted appointment as Chairman of the Committee on Paleobotany of the National Research Council.... **John W. Moyer,** in charge of the Division of Motion Pictures, has joined the Museum's Anthropological Expedition to the Southwest in New Mexico, where he will make films of the expedition's excavations and research.... **Bryan Patterson,** Curator of Fossil Mammals, and **Rainer Zangerl,** Curator of Fossil Reptiles, have returned from their paleontological expedition to Texas, where they made a notable collection of fossil specimens. Curator Patterson also did some field work in Colorado.... **Robert K. Wyant,** Curator of Economic Geology, has returned from his field work in the Mississippi Valley.... **Paul C. Standley,** Curator of the Herbarium, has returned to Honduras to continue his work of collecting and studying plants of middle Central America.... The Museum has received from **Llewelyn Williams,** Associate in Forest Products, a collection of Oriental wood specimens. Mr. Williams has for the past several months been in Thailand and Hong Kong and is soon to go to the Philippines.... **Miss Elaine Bluhm,** of the Department of Anthropology, lectured on "Archaeology and Anthropology" before students of the Lyons Township High School and Junior College.... **Donald Collier,** Curator of South American Ethnology and Archaeology, has been elected second vice-president of the Society for American Archaeology.... **Clifford H. Pope,** Curator of Amphibians and Reptiles, has returned from several weeks of studies at the Museum of Comparative Zoology at Harvard University.... **Karl P. Schmidt,** Chief Curator of Zoology, will return in August from Germany, where he has been for several months at the Senckenberg Museum and the University of Frankfort as a member of the University of Chicago faculty exchange team.

THIS MONTH'S COVER

The Museum's habitat group of Northern Fur Seal in Hall N is a subject appropriate to mark the opening of the special exhibit "Hair and Fur" (see page 3). From the skins of this mammal come some of the finest, most serviceable, and most popular furs. The summer home of this seal is in the Pribilof Islands. The herd is supervised by the United States government, and only young males are taken for furs.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received recently:

Department of Anthropology:

From: Mrs. John M. McCutcheon, Lake Forest, Ill.—a book with long, narrow pages of pandanus leaves; Mrs. John T. McClun, Chicago—8 scarabs, 4 strings of glass and faience beads, and a small box of miscellaneous beads, Egypt, and a pair of Etruscan earrings, Italy; Vinicio R. Pelaez, Cebu City, P.I.—a bronze statue (Japanese), Philippine Islands.

Department of Botany:

From: O. A. Oakes, Winnetka, Ill.—a board of *Araucaria excelsa*, Australia.

Department of Geology:

From: Wayne Proell, Chicago—a rhinoceros skull, South Dakota; Dr. G. Winston Sinclair, Ann Arbor, Mich.—a fossil mollusk, Bohemia.

Department of Zoology:

From: Chicago Zoological Society, Brookfield, Ill.—6 mammals; Lincoln Park Zoo, Chicago—a tiger; Col. Edward N. Wentworth, Chicago—a razorback hog skull; Mrs. Charlotte L. Doty, Chicago—550 lots of shells and a marine fish; Harry Hoogstraal, Chicago—266 bird skins, 2 frogs, a snake, and 61 lizards, Africa; Municipal Aquarium, Key West, Fla.—a rare marine fish, *Cornula sialis*, Key West waters; O. W. Greeman, Marion, Ky.—a mammal, Kentucky; Ross Tarrant, Palm Beach, Fla.—7 miscellaneous marine fishes and a pair of shark jaws, Florida; Jerry Choate, Big Spring, Texas—a snake, Texas; Juan José Parodiz, Washington, D.C.—46 specimens of fresh water clams, Missouri; Lillian A. Ross, Chicago—6 marine invertebrates, Cuba; Prof. Clarence R. Smith, Aurora, Ill.—a snake, Illinois; Robert T. Thompson, Cavecreek, Ariz.—2 long-horn beetles, Arizona.

Library:

From: Col. Clifford C. Gregg, Valparaiso, Ind.

'STORIES IN HAIR AND FUR' TOLD BY A SPECIAL EXHIBIT

"Stories in Hair and Fur," a special exhibit of unusual interest, will be featured in Stanley Field Hall of the Museum during the period from August 1 to September 20, inclusive. As August is the month for display of fall fashions by furriers and department stores, it is believed that this exhibit explaining major facts about the fur industry should be of value to prospective fur purchasers. Study of the exhibit will aid in appraisal of values before purchases are made.

"Stories in Hair and Fur" was prepared by the Cranbrook Institute of Science, of Bloomfield Hills, Michigan, and comes to the Museum on loan. It is really an appreciation of hair and fur. Pictures, maps, hair and fur products, mammals, and furs are assembled in thirty panels to show the kinds, types, value, and uses of fur, its influence in opening up the West, and man's management of this important resource.

TYPICAL PANEL IN FUR EXHIBIT

We take hair and fur for granted, as we do air and sunshine. Hair grows in greater or lesser abundance on all mammals, including man, who has evolved many uses for it that add to his comfort or economy. Through advertising, certain types of fur, such as mink, have become symbolic and a hidden power has been attributed to them. Lesser types of hair, although vital to daily existence, are considered commonplace and so, for example, there is little appreciation accorded the many kinds of brushes used every day.

One panel of the exhibit shows the growth of hair but does not tell how to grow hair, and another illustrates racial types of hair and compares the number of hairs in a head of red hair to that in a blonde. A variety of cloths are displayed, along with the mammals that produced the hair from which they were made.

Early North American history was influenced by the quest for beaver, and beaver pelts were the foundation on which two great fortunes were built. A map made in 1719 showing the known distribution of beaver at that time is exhibited. The mutations in mink and how they are evolved are explained by diagrams and examples of pastel, silver blue, and others, and the improvements man has made on muskrat fur by dyeing are shown. Fur from domestic mammals occupies a panel explaining how sheep skins become mouton and broadtail. Anyone contemplating the purchase of a fur coat will be able to make a much more intelligent selection after studying the four panels that fully explain the furrier's methods of changing nature's handiwork.

It might be thought that this exhibit will be of interest only to women thinking of fur coats, but that is not the case. The men will learn how their felt hats are made and what mammals their headgear represents.

It is expected that visitors will wish to see mounted specimens of the hair- and fur-producing mammals represented in the exhibit. The exhibit therefore will include directions to the habitat groups and the single mounts shown in the Museum halls.

COLIN C. SANBORN
Curator of Mammals

MOVIES FOR CHILDREN CONTINUE IN AUGUST

Two more free motion-picture programs for children will be given by the Raymond Foundation on Thursday mornings in August. There will be two performances of each program, the first at 10:30 A.M. and the second at 11:30 A.M.

The entertainments will be given in the James Simpson Theatre of the Museum. Children are invited to come alone, accompanied by parents or other adults, or in groups from clubs and various centers. Admission is free. Following are the dates and titles of the films:

August 3—BEYOND BENGAL
An expedition into the Malay jungles
(This program runs longer than normal and the second showing will start about 11:45 A.M.*)*

August 10—ADVENTURES OF CHICO
Story of a little Mexican boy

A License for Leisure

The presence of a body of well-instructed men, who have not to labor for their daily bread, is important to a degree which cannot be over-estimated; as all high intellectual work is carried on by them, and on such work material progress of all kinds mainly depends, not to mention other and higher advantages.

CHARLES DARWIN, in *The Descent of Man*

To look at his picture as a whole, a painter requires distance; and to judge of the total scientific achievement of any age, the standpoint of a succeeding age is desirable.

From JOHN TYNDALL, in "Science and Man"

Salamanders Collected

Clifford H. Pope, Curator of Amphibians and Reptiles, recently returned from the Ouachita Mountains of western Arkansas where he went in the middle of April to search for the rare woodland salamander, *Plethodon ouachitae*. At first he was unable to find this elusive amphibian because of the cold, clear weather of late spring. Soon the spring rains came and the salamanders began to appear. Curator Pope was able to secure only a few specimens a day until on May 6 he fortunately found a small area at high altitude on Rich Mountain in which the salamanders virtually swarmed. It was a simple matter to secure the large series needed for study of variation, and half of the catch was returned to its native habitat so that the life history may be investigated at a future date.

After leaving Rich Mountain, Curator Pope visited other Ouachita mountains and found what appears to be a new species closely allied to *Plethodon ouachitae*. A few specimens of this new kind apparently have been reported previously as *P. ouachitae*. This discovery is of special interest because the Ouachita salamander was thought to be widely separated geographically from its closest relatives, none having been known to live nearer than the southern Appalachians.

RAGWEEDS—VILLAINS OF HAY FEVER

By HUGH C. CUTLER
CURATOR OF ECONOMIC BOTANY

This is the season of sneezes and sniffles, of running noses and watery eyes. At least 4 per cent of the population of the United States will suffer this year from the pollen allergy we call hay fever. Some of the cases will be merely uncomfortable, many will be severe enough to require the attention of a doctor, and a few will need hospitalization.

The number of hay-fever victims is growing. Increased travel has brought people into areas where hay-fever plants grow, and the vogue for suburban living has exposed former city dwellers to the dangers of plant pollen. New roads and buildings are surrounded by disturbed land where weeds can grow and produce pollen. And because of the faster pace of modern life people are less resistant to the disturbances that the pollen poisons cause. Many of the common discomforts of summer that once were dismissed as slight colds and headaches are now, since doctors and laymen have become more conscious of allergies, known to be hay fever.

Common Ragweed

Unless we take care, the number of hay-fever victims will increase steadily. Medical science has developed drugs, such as the antihistamines, and drops and sprays for the nose and eyes. These lessen the discomfort. Injections of pollen extract may help to build up resistance and sometimes give relief after the hay fever has begun. Mechanical methods of removing pollen from the air give a great deal of relief. At home or work it is possible to keep all windows closed except those that can be screened with some form of filter. Theoretically this treatment of the air could be continued in other places by wearing a filter-mask or a small filter in the nose, but a mask is too conspicuous for most public places and a nasal filter often uncomfortable and inconvenient. So when you must leave the filtered air of your home or office, you are bound to be exposed to pollen.

ONLY CERTAIN POLLENS TOXIC

While most of the plants we know have flowers that produce pollen grains, only a relatively few kinds of pollen are toxic, produced in abundance, and light enough to be carried far by air currents. Cattails and pine trees, for example, produce abundant pollen, but it rarely causes any discomfort. The pine woods of our North and West have become favorite playgrounds for hay-fever refugees. The much-maligned goldenrod produces toxic pollen but usually in such small amounts that it is relatively unimportant. Corn, too, is a producer of highly toxic pollen and a single tassel has been estimated to produce between 20 and 50 million grains. But corn pollen is so large and heavy that it is seldom carried far from the plant.

The main offenders are the ragweeds, which cause more than 90 per cent of the hay fever in Illinois. They produce an abundance of highly toxic pollen that floats for great distances on the slightest of air currents. A single plant of ragweed has been known to release eight billion pollen grains in the five hours from 8 A.M. to 1 P.M.

The amount of pollen in the air varies with the kind and number of plants near-by, the season, and the weather. In spring there is very little pollen afloat and the majority of it is not obnoxious. It is even likely that exposure to small amounts of toxic pollen in spring and early summer gives a degree of resistance to the effects of the large masses of pollen encountered as summer progresses. Near the end of August the concentration of toxic pollen is at its peak. At this time there often are 300 pollen grains in a single cubic yard of air and on rare days as many as 900 grains.

CONTROL IS POSSIBLE

Most of the hay fever in the Chicago area could be eliminated if weeds on vacant areas of land were destroyed. There would still remain many grasses, such as June grass and timothy, and certain shade trees that would cause some hay fever, but the number of people who suffer from the pollen of these plants is relatively small. The task of destroying the weeds would be a large one. A few years ago it was estimated that 40,000 acres of the city, or about 30 per cent of its area, were allowed to run to weeds. If we include the suburbs, the percentage of unkept land would be far larger.

In the past large stands of weeds have been cut in an effort to prevent their spread and the release of pollen. Such a program reaches only the conspicuous weed areas and an even greater number of weeds is missed in the small patches along railroads, rivers, and highways and in backyards and alleys. These small patches can be destroyed only through the active co-operation of everyone in a neighborhood. If most of the noxious weeds in the Chicago area could be destroyed each year, their number would be greatly diminished the following year and before long their number would be relatively insignificant.

Formerly it was necessary to cut weeds down, a tedious and unsatisfactory method because small plants and the lower branches of the large plants are left to produce seeds and pollen. Now weeds can be killed by spraying or dusting with weed-killers that will not harm grasses (with the exception of bent grass). Weed-killer must not be allowed to touch desirable plants other than grasses, but few of these will be found in areas that ragweed and other noxious plants inhabit. Weed-killers are sold under a large variety of trade names mainly for use on lawns. The basis of most of them is a substance called 2,4-D, a short way of saying 2,4-dichlorophenoxy acetic acid.

START EARLY

For large areas the liquid spray is best; for small patches and individual plants there are cans of dusts that can be shaken directly on the plants to be killed. It is important to start killing weeds, especially ragweeds, at once, for if you can destroy these plants before they produce flowers, you will keep millions of grains of pollen from the air in your vicinity. And if the plants are killed before they produce seed, there will be fewer plants next year.

Giant Ragweed

The ragweeds most common in Illinois are shown in the illustrations, photographs of models on exhibition in the Museum's Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29). The small or common ragweed is the one found most often in lawns and backyards. It usually is less than two feet tall. Giant ragweed grows in vacant lots and is especially common beside ditches, rivers, and ponds, where it may grow to be more than six feet tall.

The illustrations on this page show the two plants whose pollen causes most of the hay fever in the Chicago area. Eradication of these from vacant lots would go a long way toward reducing the occurrence of the ailment, Dr. Cutler says. The pictures represent models of the plants on exhibition in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29).

Going fishing? At the Museum, in the Hall of Fishes (Hall O) you can see the life of fishes, other underwater creatures, and plants as they appear at or near the bottom of a typical small lake of the kind favored as fishing spots in Illinois, Indiana, Michigan, Wisconsin, and Minnesota.

CROWS ARE SMARTER THAN 'WISE' OWLS

By AUSTIN L. RAND
CURATOR OF BIRDS

THE OWL has always been considered the symbol of wisdom. The old saying has it that "fine feathers don't make fine birds," but I'm afraid that the owl has taken in people with its appearance. The owl's reputation for wisdom seems to be based on a staid, impressive appearance combined with an inarticulate disposition. Though owls do at times make a great deal of noise by hooting, shrieking, and whistling, much of the time the owl sits quietly looking wise and saying nothing.

But owls don't seem to have much behind the front they put up. People who have studied them find that the young are very slow to learn to feed themselves. One saw-

whet owl that was kept captive refused to eat liver put into its cage, apparently not recognizing the meat as food. But when the liver was crammed into an empty mouse skin the owl at once ate it. One might conclude that the owl was the original "stuffed shirt."

The crows and their relative, the jays, are the birds that are really intelligent. They are active and usually have little trouble getting enough to eat. They have an abounding curiosity that leads them to spend their time investigating things and getting new experiences. And they seem to profit by these experiences, too.

JAY LEARNS QUICKLY

That a jay learns quickly was well illustrated by a captive jay learning to pull up a small bucket-like container of food swung by a string about 8 inches below the perch. Within three days the jay was regularly pulling up the container. He would reach down and seize the string, pulling it up and holding it under his foot while he pulled up another length. He repeated this sometimes as many as five times until he could reach the bucket.

The following is how ravens co-operated in getting a bone from a dog:

"He was espied by a raven who flew down and tried to scare the dog by loud cawing, in which he was shortly afterwards assisted by another, both birds sidling up to the dog's head until they were barely out of his reach. Just at this time a third raven appeared on the scene and surveyed the situation from an adjacent fence, but soon flew down behind the dog and advanced until within reach of his tail, which he seized so roughly that the dog turned for an instant to snap at him, and at the same moment the bone was snatched away by one of the ravens at his head."

THEY RECOGNIZE PERIL

Crows have been recorded as profiting by the experience of some of their numbers. In Washington, when almonds were ripening in the almond orchards and crows were swarming there threatening to destroy the nut crop, an estimated 30,000 crows were involved and the destruction of an $800-crop was complete in two days. Various methods of control were tried unsuccessfully. Finally some almonds were slit open, poisoned, and scattered about in the orchards. Very few crows were actually poisoned, the number not exceeding 1 per cent of the flock. The first reaction of the crows when one of their flock was poisoned was extreme panic. There was tumultous clamoring and confusion. Then the flock abandoned the attempts to feed on almonds and left the area completely. Here we have a case of superior intelligence. The crows profited by the sight of a few of their number being poisoned and fled the area, thus escaping being poisoned themselves. They learned from the experience of others.

NEW MEMBERS

The following persons became Museum Members between June 16 and July 14:

Contributors

Henry W. Nichols,* Dr. William Clarence Ohlendorf.

Life Members

Dr. James W. Walker

Associate Members

Mrs. M. Lee Alberts, Philip T. Atwood, David S. Brown, David L. Shillinglaw.

Annual Members

H. E. Anning, Harve Gordon Badgerow, C. R. Baxter, Miss Mildred W. Benson, Miss Anne Bird, Carleton Blunt, William F. Borland, Martin H. Braun, Dr. Winston I. Breslin, Leonard C. Childs, Dr. Herman Chor, Marion D. Cloud, Carl Cremer, George T. Davis, Mrs. Bessie Neuberg Heinze, Adrian O. Holmberg, J. Laurence Kleinfeld, Henry T. Mathews, Donald R. McLennan, Jr., H. S. Nachman, Arthur W. Nelson, LeRoy H. Nettnin, Miss Irma L. Richards, Charles L. Schrager, L. C. Schumaker, H. Kellogg Smith, Reuben C. Taylor, Jr., Frederick F. Webster, W. E. Weitman, Donald G. Wilmarth.

* Deceased

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

"The Curator of the Department of Botany says: 'The only field work carried on has been that of Preparator Lansing, who has continued, under the supervision of the Curator, his collection of the plants of the "Lake Chicago Basin," in which he has secured an addition of 512 specimens, including many rare local species, and has continued his notes on the region. This work is particularly important, as not many years hence nearly the whole distinctive plant life of the section under study will become extinct through the drainage and reclaiming of the land and the extension of the city of Chicago and surrounding suburban towns.' "—*Annual Report of the Director, 1900.*

* * *

"The addition of microscopic appurtenances in the Division of Photography has permitted a new and important line of work to be entered upon, while the provision of new type and other facilities have brought the printing office up to a standard of considerable proficiency. . . .

"The demands of visitors for the printed guide continues with gratification, and the sixth edition made its appearance this year, somewhat improved over previous issues because of a condensation of bulk without a relinquishment of fact."—*Annual Report of the Director, 1900.*

SUMMER LECTURE TOURS GIVEN TWICE A DAY

During August, conducted tours of the exhibits, under the guidance of staff lecturers, will be given on a special schedule, as follows:

Mondays: 11 A.M.—The Earth's Story (general survey of the geology exhibits); 2 P.M.—General Tour.

Tuesdays: 11 A.M.—The World of Plants (general survey of the plant exhibits); 2 P.M.—General Tour.

Wednesdays: 11 A.M.—The Animal Kingdom (general survey of the animal exhibits); 2 P.M.—General Tour.

Thursdays: 11 A.M. and 2 P.M.—General Tours.

Fridays: 11 A.M.—The Story of Man (general survey of the anthropology exhibits); 2 P.M.—General Tour.

There are no tours on Saturdays and Sundays during August.

. . . And wilful waste, depend upon't
Brings almost always woeful want.
—ANN TAYLOR

Our Least-Known Ancestors . . .

'PRIMORDIAL PROTOPLASM GLOBULES'

By EUGENE S. RICHARDSON, Jr.
CURATOR OF INVERTEBRATE FOSSILS

Paleontologists have traced the history of plants and animals on the earth over the last half-billion years. Their studies indicate the relationship of all living things, arranged on paths diverging from a single ancestor. But the ancestor itself is a mystery—we do not know what it looked like.

A hundred years ago, men generally believed that new living things were continually and casually created daily. Green scum appeared on ponds. Frogs splashed around where yesterday there were none. Maggots suddenly appeared on old meat. People thought that the scum, the frogs, and the maggots had been newly created from the pond water or the meat, but they were not excited about it. After all, such things happened every day.

PASTEUR LED WAY

Then Louis Pasteur (1822–95), with his famous experiments, showed that all life can come only from previously existing life of the same sort. Darwin, De Vries, Mendel, and others showed that small variations always present in plant and animal populations could accumulate during many generations until new species resulted. Then people realized that all species must have come from some single ancestor and that the very first living things must have come from something not alive.

The study of earth history teaches us that only the same processes operating today have operated in the past. That being so, we should expect life to be newly created today as it once was in the dim and distant past. But Pasteur showed that it was not.

Let us examine the ancient world, as far as we can, and see what we can learn of the beginnings of life. The world was a bare place. There were lands and seas, as there are today, but, with no vegetation to hold the soil, most of the land must have been bare rock. Everything loose was swept into the sea, and in the sea we should look for the first living things.

THE SEA A 'FACTORY'

With all that water and an endless choice of dissolved mineral salts, a warm temperature, ultraviolet radiation from the sun, and electric discharges from thunderstorms, the primordial sea was almost a chemical factory operating at random. Undoubtedly, compounds of oxygen, hydrogen, nitrogen, and carbon must have been formed many times and in many parts of the sea. All organic compounds contain carbon. With the addition of the other elements, any number of gelatinous substances can be made. In time, even protoplasm itself, the substance of living cells, must have been formed.

Certainly the same initial substances, the water and mineral salts, and the same agents and processes, the warmth, the radiation, and the lightning, are still available. Why, then, don't we find newly created organic compounds in the present ocean? Is the making of these substances in the past an exception to the law that processes operating today are the same as those that have always operated?

The answer must lie in the one thing that exists today that didn't exist a billion and a half years ago: life itself. Undoubtedly, organic compounds are created in the modern oceans, but undoubtedly they are gobbled up immediately by the ever-present bacteria. So new life never has a chance any more.

TWO KINDS OF GROWTH

About a billion and a half years ago, after the right organic compounds had appeared in the oceans, one or more jelly-like blobs achieved the properties of living things: they could grow, releasing energy, and they could reproduce themselves. Many inorganic things, such as sand dunes, crystals, and icicles, "grow," but in a different way. They grow by addition of more of the original substance; living things take other substances and transform them into their own.

Now that there were living things in the oceans, these new masters of the world soon ate up the supply of organic compounds in the water. It is fortunate that these compounds were available, for the first feeble forms of life could not have foraged for food. The world's population was still in the nursing-bottle stage.

By the time that the plentiful supply of free food was used up, the conditions for the origin of new life were gone, and the descendants of the first feeders had developed countless variations, so that some forms could feed on others. Fortunately for these predators and for all their animal descendants, others of the living things were plants, with the unique and valuable plant ability of making their own food from carbon dioxide and water in the presence of sunlight. If every living thing could eat only other living things, the supply would soon disappear. This may, indeed, have happened several times, so that the whole process had to start over again, before plants, the basic food of the animals, developed their property of photosynthesis.

In these earliest days of life's history, when there was food enough for all, a great number of fantastic little animals must have occupied the seas. Such creatures would today be unable to compete for food with our efficient modern animals, but they laid the foundations for the various widely different groups that we find already developed by the time of the oldest known fossils, half a billion years ago.

Though we can make such conjectures concerning the origin of life on this planet, we still have not answered the questions of what the first living things looked like, whether there was one primitive ancestor or many, and how they first became living organisms rather than merely organic chemical compounds.

DIGGING IN MICRONESIA

From Dr. Alexander Spoehr, leader of the Museum's Micronesian Anthropological Expedition, which has been conducting a combined ethnological and archaeological project in the Marianas Islands of the South Pacific since 1949, comes the following field report on progress.

By ALEXANDER SPOEHR
CURATOR OF OCEANIC ETHNOLOGY

Archaeological work during the quarter was concentrated on Tinian Island. This consisted of a survey of archaeological sites on Tinian, followed by excavation of two of the most important sites. I believe that all stone-column, or *latte*, sites have been located, as well as those that do not possess this characteristic prehistoric feature. Eleven major latte sites were found. As on Saipan, these tended to be located along coastal beaches, adjacent to good farm land. Three were built in an interior valley.

Following the survey, excavations were conducted at the Blue Site and at the House of Taga.

The Blue Site. This site consists of a prehistoric village of twelve lattes, forming an irregular line immediately to the east of the beach designated as Blue Beach during the Japanese invasion. The site was mapped and the center latte of the group excavated. This center latte, the largest in the village, consisted of twelve stone columns, the length of the house being approximately 60 feet. The soil was very shallow at the site and no stratigraphy was found, although two dump heaps were also excavated. From the extremely abundant pottery and other cultural material, this site can be allocated to the same cultural horizon as the Saipan latte sites. The importance of the Blue Site is that it afforded an opportunity to determine the settlement pattern of a prehistoric latte village. The characteristic features of this settlement pattern are: the end-to-end alignment of the lattes, paralleling the shore line; the location of the largest and most impressive house in the center of this alignment, this house probably forming a council or chief's house; the presence of numerous small dump heaps to the seaward side of the lattes; and the location of burials beneath the houses.

The House of Taga. The House of Taga consists of a single latte house, the only one left of a series of 18, which originally—according to fragmentary accounts—formed a village similar to the Blue Site. The lattes at the House of Taga are the largest

and most impressive in the entire Marianas, each stone column having been 16 feet high. There is only one column left intact and standing, surmounted by a capstone that unfortunately is partly broken off, possibly as the result of shellfire during the American attack on Tinian.

ETHNOLOGICAL PROJECT

During the quarter, ethnological work was conducted on both Saipan and Tinian.

Tinian. During the period of archaeological work, ethnological investigations were made in the small Chamorro community on Tinian. This community consists, in the majority, of Chamorros moved from Yap to Tinian after the war, with the remaining families coming from either Rota or Saipan. The Tinian Chamorros therefore represent a displaced group and offer the opportunity of investigating the problems of adjustment among a small, easily observable unit that has been relocated in a new environment. The principal problems of adjustment revolve about the fact that on Yap the Chamorros were not farmers, while on Tinian their only sound future economy must be built on agriculture. Likewise, on Yap they formed a separate but loosely knit ethnic group, while on Tinian a successful adjustment demands a higher degree of community co-operation and a formulation of community goals, neither of which yet has been achieved.

Saipan. Most of the ethnological work of the quarter was concentrated on Saipan. Except for brief trips to Tinian, Rota, and possibly Alamagan and Agrigan, the remaining period of field work will be concentrated on Saipan. The Saipan community, which is in process of formation and hence in a state of flux, presents complex problems.

During the quarter, work was continued with the Carolinian segment of the native population. Land ownership and use, the patterns of co-operation in daily activities, the organization of household and family, the kinship system and related forms of descent groupings, and the postwar changes in Carolinian social organization formed the focal points of investigation. The principal contrasts between the Carolinians and the Chamorros have been outlined, and this phase of the investigation is nearly completed.

Among the dominant Chamorro group, work has been concentrated on land ownership and use, inheritance customs, and the organization of agricultural production. This aspect of Chamorro culture is fundamental for an understanding of contemporary Chamorro life. It is an aspect of the culture that at present is highly unstable, and a number of serious administrative problems are associated with it. The information obtained to date will be of both theoretical and practical importance.

In general, the aim of the ethnological project on Saipan is to determine areas of relative stability and instability in contemporary Chamorro culture, insofar as these affect the formation of an integrated community based on a sound economy. To date, the relationships between the Carolinian and Chamorro groups and customs associated with the ownership and use of land resources have been the principal points of investigation. During the next quarter, the investigation will be extended to family and kinship organization, which exhibits a number of unstable features, the principal one being a relatively high incidence of juvenile delinquency, or at least non-co-operation and antisocial behavior. Also, it is planned to investigate the religious organization, which is an element of great stability in this community, the class structure, and the local political organization. These form the principal areas of future investigation.

INDIAN FISHERMEN

By DONALD COLLIER
CURATOR OF SOUTH AMERICAN ETHNOLOGY AND ARCHAEOLOGY

The modern sporting-goods store contains a bewildering array of specialized devices for catching fish. In looking at a fishing-tackle display one is apt to take satisfaction in modern ingenuity and technology, forgetting that most of the gadgets before him are merely streamlined chromium-plated models of fishing devices going back hundreds or thousands of years.

FISHING WITH BOW AND ARROW
The method employed by these Indians living along the border of Brazil and Colombia is typical of that used by tribes of the Upper Amazon.

The American Indians were among the world's most skillful fishermen. In most regions of North and South America fish was an important Indian food. In the Americas as a whole every modern method of fishing, with the exception of fly casting, was known, as well as a number of methods not used today. Several Indian fishing techniques, such as the drugging or poisoning of fish and torchlight fishing, are prohibited in this country today. It should be remembered that the Indians were not confronted with our modern problem of fish conservation and that they fished for food, not for sport.

DEVICES ON EXHIBITION

Some of the common fishing devices used by Indians were hooks made of bone, stone, wood, thorn, shell, or copper, and gorges, arrows, spears, harpoons, gigs and leisters, dipnets, landing nets, casting nets, dragnets, seines, traps, and weirs. Examples of these implements are on display in the Museum's Indian exhibits, particularly the halls dealing with American archaeology (Hall 4), the Northwest Coast Indians and Eskimos (Hall 10), and South America (Hall 9). Evidence that many of these fishing methods have a long history in the New World is furnished by such finds as bone fishhooks in the shell mounds of Kentucky, known to be 5,000 years old; the ancient fishweir covering two acres, thought to be 4,000 years old, excavated under Boylston Street, Boston; and fishing implements from shell middens along the Strait of Magellan, believed to be from 3,000 to 5,000 years old.

A common and simple but effective Indian fishing device was the gorge, consisting of a straight pin of bone or wood sharpened at both ends and attached to a line by the middle. This pin was run through a dead minnow, and when the minnow was swallowed by a fish, a jerk of the line pulled the pin sideways and caused the points to pierce the mouth of the fish. The Haida Indians of British Columbia made a snap hook of a hoop of wood, the ends of which were held apart by a wooden peg. This peg was displaced when a fish took the bait and the hoop snapped together, holding the fish by the jaw. The most elaborate hook was that used by the Eskimos. The upper half of its shank was made of stone and the lower half of ivory, into which was set a curved spike of bone or metal lashed with whalebone quill. A leader of quill was attached to the hook and a bait of crab shell was hung above the spike.

DRUGGING AND SHOOTING

The two favorite fishing methods of the tropical forest Indians of South America are drugging with narcotic plants and shooting with bow and barbed arrow. More than a hundred different plants are used for poisoning fish. One of the commonest of these is barbasco or cubé (*Lonchocarpus nicou*), the derris root of industry, which is the chief source of the insecticide rotenone. The fish drug, prepared by crushing the tendrils of or extracting the sap from the narcotic plant, is thrown into a still pool or a slow-flowing stream. As the stupefied fish come to the surface they are shot with arrows, caught in dipnets, or scooped up with the hands. The constituent that drugs

(*Continued on page 8, column 3*)

SOVEREIGNS AND SCIENCE

By FRITZ HAAS
CURATOR OF LOWER INVERTEBRATES

A recent acquisition in the Library of Chicago Natural History Museum is a Japanese book* dealing with the sea-slugs of Sagami Bay, Japan. This exceptionally fine publication contains numerous plates in color illustrating these shell-less snails that are often found to be both striking and brilliant in color. The highly technical nature of this volume makes it of interest primarily to the scientist. But the fact that the data was collected by the Emperor of Japan puts the publication into the field of general interest.

It is well known that Emperor Hirohito has a strong leaning toward the natural sciences. This is evidenced by his maintenance of the small biological station at his summer villa on Sagami Bay, where he has devoted many years to searching the waters of this basin for their fascinating marine fauna. All specimens found during this time were photographed while alive and fresh, and fragile specimens and those likely to deteriorate or to lose their colors when immersed in preserving fluids were sketched in color by a special artist.

IN TWO LANGUAGES

The Emperor, who considers himself an interested layman, entrusted all the sea-slugs he had collected to Dr. Kikutaro Baba, a noted authority in this field. The results of Dr. Baba's research were published in both Japanese and English. A book of this magnitude, containing the many colored plates necessary to illustrate all the specimens found, and one of such excellent workmanship in print and binding, is exceedingly expensive to publish even under normal conditions. The cost would be prohibitive after a war that had been lost. The assumption, therefore, that the Emperor may have paid a portion or all of the expenses of publication may not be erroneous. The appellation of "Patron of the Sciences" has been merited by the Emperor through his work and such contributions. Throughout history, kings and emperors of Siam, China, and Japan encouraged the fine arts. But it is here for the first time that an Oriental potentate has shown a stimulating and practical interest in natural history.

SPURRED BY CURIOSITY

It was not until geographical exploration and discovery had reached the more distant horizons during the 16th and 17th centuries that the western world indicated its desire to learn more about the natural sciences. Returning vessels brought to their respective homelands a wealth of strange animals and plants found in newly discovered countries. Curiosity was a powerful influence that stimulated the urge to collect and display these newly found objects and resulted in the development of research in this interesting branch of knowledge.

Thus began the collection called the Cabinet du Roi in France. The Holy German Empire established a similar collection at Vienna and called it Museum Caesareum. Corresponding cabinets were collected by sovereigns of lesser countries. These cabinets, privately founded and owned, were the forerunners of the public museum of today. Among the renowned museums that developed from these private collections are the Muséum National d'Histoire Naturelle in Paris (formerly the Cabinet du Roi) and the Kais. Kgl. Naturhistorische Hofmuseum in Vienna (formerly the Museum Caesareum Vindobonense). The practice of prefixing the names of these public museums with the word "imperial" or "royal" was primarily to emphasize sovereign patronage in these institutions and not to indicate private ownership. With the decline of royalty in central Europe, the references to princely patronage gradually disappeared from the names of the museums and were superceded by the word National, Austrian, Prussian, etc. This trend is reflected in the creation of the Oceanographical Institute and Museum in the principality of Monaco. Here, the founder, Prince Albert, whose beneficence in this connection is not publicized, judiciously employed the funds derived from the princely owned gaming tables at Monte Carlo in the endowment and maintenance of these two highly important and growing institutions.

Following the examples of their sovereigns, the wealthy aristocracy began to endow the biological sciences, as well as to build large private collections of birds, insects, and shells. Their care was entrusted to the specialists who prepared the specimens for purposes of exhibition and further research. Upon the death of the founder, the collection was generally given to a public museum or formed the basis of a new museum. Occasionally, wives of reigning sovereigns displayed equal interest in natural history and expressed their interest in establishing smaller museums of their own. One such historical example was the collection begun by Louise Ulrica of Sweden, which was to become the basis for one of the classical studies by the renowned Linnaeus. Profound interest in the sciences caused certain members of the high nobility to become distinguished specialists. One such individual was a nephew of Napoleon I. Expeditions for the purpose of exploration and further development in the fields of science were promoted as well as undertaken by others. The active interest and patronage of Prince Maximillian Wied-Neuwied is an outstanding example of individual achievement in the natural sciences.

By about 150 years ago, the general public had elevated its standard of living to a point where the need to give expression to this knowledge and wealth was felt. Interpreting the example of "noblesse oblige" literally in that wealth obliges as well as does nobility, the well-to-do citizens provided the resources for public instruction in the field of natural history. Thus was born the famous Senckenberg Museum, when the physician Johann Christian Senckenberg of Frankfurt am Main in 1772 bequeathed his accumulated wealth, specimens, and books to a foundation of his own with the words "I wish to erect a temple to the sciences."

During the past century many great expeditions have been sponsored by individuals of great moral and intellectual advancement. A layman explorer of repute and esteem was Eduard Rüppell, who, inspired by the fine precedent established by Senckenberg, explored the Sudan, the Kordofan, and Abyssinia in the second and third decades of the 19th century. His entire resources were devoted to exploration, the care of his collections at Senckenberg Museum, and the purchase of scientific literature.

CITIZEN-SPONSORS

While rulers in the Orient continue to enjoy the prestige of fostering the sciences, the western world is no longer dependent upon this royal patronage. Today the enlightened and responsible citizen recognizes the importance of supporting research, and it is with pride that we are able to point to the monuments of his endeavor represented by such institutions as the Smithsonian in Washington, Harvard in Cambridge, Massachusetts, and Chicago Natural History Museum. The promotion of pure science is becoming increasingly important and the opportunity for continued research is greatly facilitated through the generosity of civic-minded individuals.

*Opisthobranchia of Sagami Bay, collected by His Majesty, the Emperor of Japan, described, with an introduction by Kikutaro Baba, D.S.

INDIAN FISHERMEN—

(Continued from page 7)

the fish is not harmful to human beings. Fish poisoning was practised to some extent also by the Indians of Central America, eastern United States (e.g., by the Iroquois and Cherokees), and California.

A unique and ingenious fish trap was used by some of the upper Amazon tribes and in the Guianas. A conical basket, which was attached to a spring pole and placed between crossed sticks in a stream, was held in place by a baited trigger. When a fish entered the basket and touched the bait, the trigger was released and the basket swung up into the air with the fish head-down inside. This would be an excellent device for the Chicago lake-front fishermen but would require a special trap license and might have to be modified to conform with federal regulations pertaining to fish traps.

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Lake Shore Drive, Chicago 5

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Members are requested to inform the Museum promptly of changes of address.

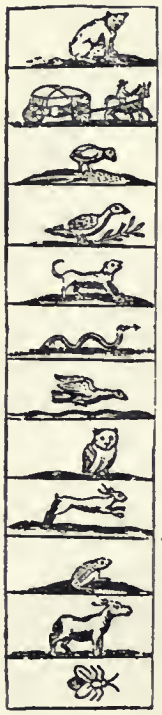
'C' IS FOR 'CAT'

The idea of a museum as an educational institution is relatively new. In such a museum the object is, as one of the great means of transmitting our heritage of culture from the past to the rising generation, to make freely available and visible and even tangible the world and all upon it and in it. The limited hours of admission to the British Museum (London) when it was founded less than 200 years ago and the fact that prospective visitors had to meet rigid standards of moral reputation and deportment if they were to enter at all seem curious to a staff member of a modern museum.

The newness of the idea of museum collections as a conspectus of the world's plants and animals and minerals instead of as an assemblage of curios may be seen against the background, in our western civilization, of a relative newness even of the art of book illustration. It is astonishing to us, who are faced with so great a wealth of illustration in black and white and in the richest colors in books and magazines, to learn that there were no illustrated books for children earlier than the German and Latin *Orbis Pictus* of the Bohemian educational reformer Johannes Amos Comenius, published in Nuernberg in 1657 and translated in the following year into English.

The idea of a "world in pictures" with an explanatory text that could serve for the teaching of another language was an almost revolutionary innovation. The second language, in the 17th century, could only have been Latin, which was the necessary key to the higher education of the time. This work by Comenius passed through eleven editions in England by 1728 and was in use for at least another century. This praiseworthy effort to present the world in pictures and, as the author intended, to make learning actually a pleasure for children instead of a kind of punishment seems to me to lie in the most direct ancestry of our modern education experiments, of the illustrated encyclopedia, and especially of museums of natural history.

The old work of Comenius was republished in Syracuse, New York, by C. W. Bardeen, in 1887, and my father's copy is before me. The old engravings, with their minute figures, are primitive enough; but the method of teaching through familiar things and through the juxtaposition of the languages is fresh and novel enough to deserve more attention from modern educators. The animal alphabet must be the first ever printed. The succession of subjects extends from elementary ideas of religion, through animals and plants, to the phenomena of nature and the arts of man. A specimen illustration serves better than further comment to give something of the flavor of the old Comenius picture book for the children of nearly 300 years ago.



Felis clamat, nau nau — N n
The *Cat* crieth.

Auriga clamat, ò ò ò — O o
The *Carter* crieth.

Pullus pipit, pi pi — P p
The *Chicken* peepeth.

Cúculus cuculat, kuk ku — Q q
The *cuckow* singeth.

Canis ringitur, err — R r
The *dog* grinneth.

Serpens sibilat, si — S s
The *Serpent* hisseth.

Graculus clamat, tac tac — T t
The *Jay* crieth.

Bubo ululat, ù ù — U u
The *Owl* hooteth.

Lepus vagi., va — W w
The *Hare* squeaketh.

Rana coaxat, coax — X x
The *Frog* croaketh.

Asinus rudit, y y y — Y y
The *Asse* brayeth.

Tabanus dicit, ds ds — Z z
The *Breeze* or *Horse-flie* saith.

Part of "animal alphabet" first published in 1657

That Comenius thought of his work in terms of a revolutionary improvement in education is clear from the preface to the original edition, which, under old-fashioned phraseology, has a strikingly modern tone. For example:

"To entice witty children to it, that they may not conceit a torment to be in the school, but dainty fare. For it is apparent, that children (even from their infancy almost) are delighted with Pictures, and willingly please their eyes with these lights: And it will be very well worth the pains to have once brought it to pass, that scarecrows may be taken away out of Wisdom's Gardens."

KARL P. SCHMIDT
Chief Curator of Zoology

THIS MONTH'S COVER

September is the time for going back to school. For many children and also for students in high schools and colleges, it is also the time for going back to Chicago Natural History Museum for supplementary studies among Museum collections that are correlated with the more formal curricula of their classrooms. Teachers and students have made it evident that they regard the sessions in the Museum as among the most enjoyable as well as most profitable parts of the educational process. Our cover shows a typical group of young people on their way into the Museum in pursuit of knowledge. At this time the authorities of this institution take pleasure in welcoming back the thousands who will repeatedly come here in such groups, not only from the schools of Chicago but from other parts of Illinois and neighboring Middle Western states.

NEW MEMBERS

The following persons became Museum Members between July 17 and August 11:

Associate Members

Roy W. Siemund

Annual Members

Alfred Benesch, A. P. Brown, Cameron Brown, O. R. Burns, Peter T. Burns, Oliver J. Corbett, John J. Devery, S. B. Dilibert, W. J. Fitzpatrick, Clinton E. Frank, Dr. Warren W. Furey, George J. Haddad, Lloyd Hasty, Frank X. Henke, Jr., George A. Kuyper, Trygve Maseng, Henry W. Meers, Earl Miller, Dr. H. M. Serota, Thomas P. McGuire, Sigurd Olsen, Mrs. Clement D. Stevens, Edward L. Taylor, A. C. Traub.

Books must follow sciences, and not sciences books.

FRANCIS BACON, in "Proposition Touching Amendment of Laws"

ATOM DEFENSE REVALUATES THE ANCIENT ART OF TATTOO

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

THE POSSIBILITY of giving tattoo marks to indicate blood types and so to insure speed and safety in transfusions that might be necessitated by an atomic bomb attack was the subject of inquiry by the newspapers recently.

The exact antiquity of the practice of pricking the skin and introducing pigment is unknown. There is, however, in the Royal College of Surgeons, London, an exhibit that assures us that tattooing by puncture was practiced in Egypt about 1300 B.C. The exhibit consists of three pieces of human skin and a small clay doll taken from a Nubian cemetery in Egypt. Microscopic research showed that the lozenge-shaped marks are true tattooing, since the blue coloring is in the dermis or true skin. With the skin is a small figurine of clay that bears marks corresponding in shape to those on the human skin.

The girls of Chicago expressed many suggestions to reporters respecting the most desirable, or shall we say the least objectionable, locations for the tattoo mark. All were agreed on the need for concealment, and here they differ markedly from their primitive sisters, whose main desire is to wear facial tattoo marks for adornment and an indication of social distinction. Women of the Ainu tribe, northern Japanese islands, tattoo (or did so until recent times) elaborate moustaches. The men are naturally hairy, with well-developed beards and moustaches. Apparently the women were envious of the male adornment and wished to imitate it.

PERMANENT 'BEAUTY SPOTS'

Facial markings, usually tattooing by puncture and especially tattooing of the chin, have been widely accepted by many tribes in various parts of the world as a desirable female embellishment. In southeast New Guinea tattooing of a girl's face and body is done by easy stages over a period of several years. The completion denotes maturity and fitness for marriage, and the occasion is celebrated by a feast.

There are a few instances of hidden tattoo marks, notably those recorded by a criminologist named Lombroso. He examined inmates of jails in Italy and France and came to the conclusion that criminal gangs and members of secret societies were often the bearers of tattoo marks that were symbolic of their gangster unity. In early Colonial America and in many countries of Europe the hunting of witches was a crude pastime as well as a religious duty. Many innocent old women were executed because of their eccentricities and the physiological fact that as the teeth disappeared the nose tended to reach downward and the chin upward. Court officials searched for tangible evidence of witchcraft, and the records state that members of a society pledged to sorcery often bore concealed tattoo marks. A tattoo picture of a toad was one of the common symbols of witchcraft. The presence of such a mark—called the devil's tattoo—was held to be undeniable evidence of guilt.

SAILORS' SENTIMENT

The writer's interest in tattooing was first aroused by observation of the tattooed designs of men of the Royal Naval Division and the Marines with whom he served in Gallipoli and France in 1914–18. The "in memoriam" design was a common one. In one instance there was a tombstone design beneath these words. On each side of the stone a sailor stood with bowed head and cap in hand. An added epitaph, all neatly tattooed, was "in loving memory of my dear mother." A few sailors carried on their forearms a record of their infidelity. The names Molly and Mary were partly deleted and the most recent conquest, Jane, was left intact.

The most elaborate tattooing, sometimes in several colors and covering the entire body, has been done by Burmese, Japanese, and natives of the Marquesas Islands (Polynesia). Many years ago the French government prohibited tattooing in the Marquesas Islands, and the Japanese government passed a similar edict.

To an anthropologist, tattooing is of interest not merely because of the intricacy and artistic merit of the designs. There is no doubt that from ancient, probably from prehistoric, times the practice had a social and psychological significance. For women the embellishment meant marriageable status. For men, marking the body was part of the tests of endurance associated with puberty rites. Tattoo marks of males have represented social distinction by birth, by prowess in war, by success in head-hunting, and in making canoe voyages.

MAORIS GO FARTHER

Among the Maori of New Zealand, who are Polynesians, a peculiar form of body marking called moko was developed. The operator chiseled grooves in the skin penetrating rather deeply into the dermis (skin under the outer layer). The instrument used was a small adze with a serrated bone edge. Into these facial and body cuts, which were usually in the form of spirals, red ochre or soot was rubbed. When the thighs were treated in this way the body appeared to be clad in a tight-fitting garment. The operation was performed by a well-paid specialist, sometimes a priest, who graded his class of work and the time taken according to the status and wealth of his patient.

During the period of tattooing, a warrior

(*Continued on page 7, column 2*)

FUR EXHIBIT TO CONTINUE; ANIMAL PHOTO SHOW ON WAY

The special exhibit, "Stories in Hair and Fur," which opened in Stanley Field Hall on August 1, will continue on display until September 20. This demonstration of major facts about the fur industry is here on loan from the Cranbrook Institute of Science, of Bloomfield Hills, Michigan. An added feature, provided by members of the Associated Fur Industries of Chicago, Inc., is a case of finished fur garments of various types. These are changed each week of the show.

Shortly after the close of the fur show, the Museum will open another special exhibit, "Animals in Action." This collection of unusual photographs of wild life is a one-man show by the noted nature photographer Roman Vishniac of New York, whose work frequently appears in *Life* magazine. The photo show is scheduled for October 1 to 31, inclusive.

FASHION MODELS AT MUSEUM FUR SHOW

At opening of special exhibit, Sandi Wells (left), Elaine Winn, and Joyce Ann Byers ("Miss Associated Fur Industries for 1950") posed for press photographers with garments supplied by local furriers.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The nucleus for the zoological collections in the newly organized Columbian Museum of Natural History (later to be Field Museum of Natural History, and now Chicago Natural History Museum) consisted of the mounted animals displayed by Ward's Natural Science Establishment of Rochester, New York, at the World's Columbian Exposition of 1893.

Beginnings of the Zoological Exhibits

The entrance to the main zoological hall in the Fine Arts Building, taken over by the new museum, was flanked by mounted elk and moose, with sea turtles and a spider crab and mounted crocodile hung on the wall and with a hanging model of a bottle-nosed whale overhead.

The old specimens exhibit the unsatisfactory taxidermy in vogue at the time of the World's Fair. Almost all of the old specimens received with the original collection have been replaced with newly mounted material. Exhibition of specimens not in glass cases has of necessity been reduced to a minimum, because the "Hands Off" signs proved ineffectual. The visitor should compare the habitat groups of the American elk and Alaskan moose in Hall 16 for examples of the best of modern taxidermy in contrast to the old exhibits.

* * *

The nature of the Museum's publications in 1900 is well indicated by two specimen titles: *List of Mammals Obtained by Thaddeus Surber, Collector for the Museum, Chiefly in Oklahoma and Indian Territories*, by D. G. Elliot, and *Plantae Utowanae* (plants collected in Bermuda, Puerto Rico, St. Thomas, Culebras, Santo Domingo, Jamaica, Cuba, the Caymans, Cozumel, Yucatan, and the Alacran Shoals, December, 1898, to March, 1899), by Charles F. Millspaugh.

Modern Taxidermy—Alaskan Caribou, Hall 16

Chiidren's Programs Coming

The Raymond Foundation will present the first of its Autumn Series of free motion-picture programs for children on Saturday morning, October 7, at 10:30 A.M. These will continue on Saturdays throughout October and November. Like the adult programs, they are given in the James Simpson Theatre. The first one, "Big Bend Adventure," will be accompanied by a talk by Allan Cruickshank of the National Audubon Society. Details of the entire eight programs will be given in the October issue of the BULLETIN.

SEPTEMBER LECTURE TOURS, DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Fri., Sept. 1—Camouflage as Taught by Nature. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Sept. 6—Animals of the Six Continents (*Jane Sharpe*).

Fri., Sept. 8—Fashions in Furs. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., Sept. 13—Natural History Facts and Fallacies (*Lorain Farmer*).

Fri., Sept. 15—Adapt or Become Extinct. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Sept. 20—Nature's Sweet Tooth—Story of Sugars (*Marie Svoboda*).

Fri., Sept. 22—Strange Sea Animals. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Sept. 27—Measuring and Record-keeping—Early and Primitive Instruments and Writing (*Harriet Smith*).

Fri., Sept. 29—Nature's Fall Color Show. Illustrated introduction in Meeting Room (*Miriam Wood*).

There will be no tour on Saturday, September 2, and Monday, September 4, on account of the Labor Day week-end holiday, but the Museum will be open.

Technical Publications Issued

The following technical publications were issued by the Museum recently:

Fieldiana: Botany, Vol. 27, No. 1. *Contributions to the Flora of South America. Studies on Andean Compositae—I. Studies in South American Plants—II.* By José Cuatrecasas. June 8, 1950. 114 pages, 12 text figures. $1.75.

Fieldiana: Zoology Memoirs, Vol. 2. *Amphibians of Western China.* By Ch'eng-chao Liu. June 15, 1950. 400 pages, frontispiece, 2 halftone plates and 8 colored plates, with captions opposite, and 100 text figures. $7.50.

GEOLOGIC PERIODS: HOW OUR CONCEPTS HAVE CHANGED

By EUGENE S. RICHARDSON, Jr.
CURATOR OF INVERTEBRATE FOSSILS

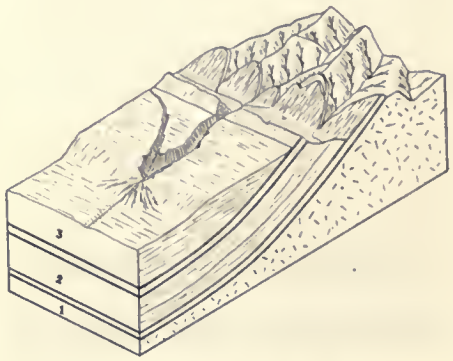
A hundred and twenty-five years ago it was a simple matter to learn the names applied to the periods of geologic history. It was just like one-two-three-four: Primary, Secondary, Tertiary, and Quaternary (the last one was added in 1829).

It was equally easy to recognize the rocks belonging to those four "periods." All hard igneous and metamorphic rocks were Primary because they looked older than the others and were generally found beneath them in the cores of mountain ranges. The fossil-bearing hard sedimentary rocks that tilted up against the Primary rocks were called Secondary because they were obviously created later and less had happened to them. On top of these were soft fossil-bearing sedimentary rocks, generally not tilted and apparently formed of the debris of Primary and Secondary rocks. "Tertiary" was a reasonable name for these. The name "Quaternary" was then appropriately adopted for the thin cover of glacier, stream, and lake deposits and volcanic lavas that lay upon all the others in patches.

Presently, however, people noticed that each bed or group of beds of sedimentary rock had certain fossils different from those in other beds and that some layers with characteristic fossils could be traced from a clearly Tertiary terrain in one place, through a Secondary area in another, to a region where they blended right into the Primary rocks. So it appeared that these terms were worthless as time terms.

We know now that there are sandstones in Wisconsin of Cambrian age (*see Table 1*), so soft and Tertiary-like that the winds build sand dunes on their outcrops, and that there are Quaternary rocks in Oregon and California that have been hardened and tilted and even partly metamorphosed, during the building of the Coast Range, to such an extent that they would formerly have been called "early Secondary."

It is to Sir Charles Lyell, Sir Roderick Murchison, and the Reverend Adam Sedgwick, of England, that we owe the modern concept of the geologic periods and many of their names. The three earliest periods following the appearance of life on the earth are the Cambrian, Ordovician, and Silurian periods. In 1835, Murchison, working in the hills and fields of Shropshire, described a succession of thousands of feet of ancient gray shales and limestones with distinctive fossils lying beneath the "Old Red Sandstone" of western England. Using a classical name, he christened these rocks in memory of the tribe of Silures, whom Julius Caesar had fought in that region. In the same year, Sedgwick, working in Wales, described a similar but older succession of rocks and named them for Cambria, the Latin name of Wales itself. These names were applied to the actual sequences of rocks rather than to time periods. Each of these sequences,



YESTERDAY'S SCIENCE

The succession of rocks as they would have been named 125 years ago: 1. Primary, 2. Secondary, 3. Tertiary. The Quaternary rocks are represented by an alluvial fan at the base of the nearest slope.

plus all other rocks in the world of the same age, constitutes a "system."

It was soon noticed that the lower part of the Silurian system and the upper part of the Cambrian system had the same fossils in them and were, therefore, of the same age. In 1874, Professor Charles Lapworth gave this intermediate part a new name, derived from that of a Welsh tribe that had resisted Caesar's invasion, the Ordovices. Other systems have been named in a similar way, though not all the names have such classical derivations. The periods, defined as the time of deposition of the systems, are given the same names. In *Table 1* the names now used for the geologic periods are shown, together with their type areas, the region in which each system was first formally described. Two of the old names still in use, "Tertiary" and "Quaternary," no longer have their old rock-type meanings.

Just as geologic time is divided into periods, each period is again divided into

(*Continued on page 8, column 3*)

TABLE 1

TIME DIVISION	*BEGAN YEARS AGO*	*NAMED BY*	*TYPE AREA*
Archaean era	3,000,000,000	James Dana, 1872	(world)
Algonkian era	1,500,000,000	Charles Walcott, 1889	central Canada (territory of Algonkian Indians)
Paleozoic era (era of "ancient life")			
Cambrian period	540,000,000	Adam Sedgwick, 1835	Wales (Cambria)
Ordovician period	450,000,000	Charles Lapworth, 1874	Wales (territory of the ancient Ordovices)
Silurian period	380,000,000	Roderick Murchison, 1835	Shropshire, England (territory of the ancient Silures)
Devonian period	350,000,000	Murchison and Sedgwick, 1836	Devonshire, England
Mississippian period	310,000,000	Alexander Winchell, 1861	Mississippi River Valley
Pennsylvanian period	280,000,000	Henry Williams, 1891	western Pennsylvania
Permian period	240,000,000	Roderick Murchison, 1841	Perm Province, Russia
Mesozoic era (era of "mediaeval life")			
Triassic period	200,000,000	F. von Alberti, 1834	named for three ("tri-") conspicuous beds of rock in Germany
Jurassic period	175,000,000	Alexander Humboldt, 1799	Jura Mountains, French-Swiss border
Cretaceous period	110,000,000	J. J. d'Omalius d'Halloy, 1822	chalk cliffs, English Channel (Latin for chalk is "creta")
Cenozoic era (era of "recent life")			
Tertiary period	75,000,000	Giovanni Arduino 1759	see discussion in text
Quaternary period	1,000,000	J. Desnoyers, 1829	see discussion in text

TABLE 2

Epochs of the
Tertiary and Quaternary periods

Quaternary period
- Recent epoch
- Pleistocene epoch

Tertiary period
- Pliocene epoch
- Miocene epoch
- Oligocene epoch
- Eocene epoch
- Paleocene epoch

CHANGES IN CULTURES OF U. S. INDIANS

By GEORGE I. QUIMBY
CURATOR OF EXHIBITS, ANTHROPOLOGY

INSTEAD of turning swords into plowshares, the western Woodland Indians turned gun barrels into flutes, probably when the guns were worn out. A gun-barrel flute from the Museum's collections is illustrated in Figure 1 (*bottom*), where it is compared with the native form of flute made of wood (*top*). The Indian substitution of the

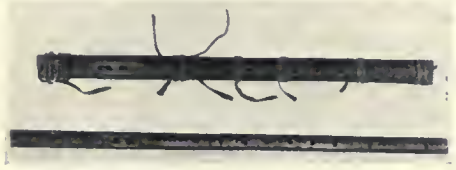


Figure 1

iron gun barrel for wood in the manufacturing of a flute is an expression of culture change brought about by contact with another culture, that of the white men.

A similar example of culture change expressed in objects in the Museum's collections is provided by the western Woodland Indian rattle shown in Figure 2 (*left*). This rattle was made from an empty baking powder can. For comparison, a native type rattle made of a hollow gourd is also

Figure 2

shown in Figure 2 (*right*). It can easily be seen that the tin can has been substituted for a gourd.

In both the use of the gun barrel for a flute and the tin can for a rattle, we have examples of a simple type of culture change—change by substitution of one material and/or thing for another without any significant change in the function or form of the object (artifact) that is an expression of Indian culture but shows the influence of the white man's culture. In the Museum's collections there are many examples of this principle of culture change, but the two examples given above will suffice to illustrate the point.

Another minor principle of culture change is expressed in the pair of Eskimo snow goggles shown in Figure 3 (*left*). This pair of goggles is made of sooted glass lenses set in a wooden frame. Contrasted with it in Figure 3 (*right*) is a pair of wooden snow goggles made in the traditional Eskimo way with eye slits instead of glass lenses. These

Figure 3

two pairs of Eskimo snow goggles indicate a kind of culture change in which there is a substitution of an introduced principle for a native principle with some alteration in the traditional form of the object to accommodate the new material and principle. In this case the principle of excluding light by dark-colored lenses has been substituted for the principle of excluding light by constricting the opening over the eyes.

In some cases the material evidence of culture change is merely the presence of a foreign culture element. An example from the Museum's collections is illustrated

Figure 4

in Figure 4. This object, a Republican campaign handkerchief for the 1892 election, was used by the Pawnee Indians of the Plains as a wrapper for a sacred war charm. The traditional wrapper would have been the skin of an animal that possessed supernatural power. But in this case the Indians used a wrapper of foreign manufacture—part of the content of a foreign culture.

It seems doubtful that the Pawnee were supporting "Harrison and Reid," "Sound Money," "Protection to Home Industries," "Reciprocity," or the Republican Party. Yet the handkerchief was considered suitable as a wrapper for their sacred war charm. So in this case we have an example of a transfer of an actual object from one culture to another, but a change in the meaning and use of the object, once the transfer has taken place.

Another example of the introduction of a foreign element into Plains Indian culture is provided by paintings of an Assiniboin chief made by George Catlin in 1832. In

Figure 5

Figure 5 (*left*) is shown the traditional ceremonial garb of the Assiniboin chief and (*right*) the same man after a visit to Washington, D.C., in 1832. The Assiniboin chief seems to be doing his best to integrate a foreign introduction into his native culture.

Still another kind of culture change that can be observed in the Museum's collections of North American Indian objects involves the copying of introduced forms but using traditional native techniques and materials for the copying of the new forms.

Figure 6

In Figure 6 is shown part of a wooden chess set collected from Northwest Coast Indians in southern Alaska. This set probably is a copy of Russian chess sets. Another example from the Northwest Coast Indians of British Columbia is shown in Figure 7. It is a bellows made of native materials and decorated in traditional fashion. It was used for blowing a ceremonial whistle.

Figure 7

A somewhat similar principle of culture change is involved in

the instances in which Indians portrayed foreign forms and concepts by traditional native styles of engraving, painting, and sculpture. An example of this principle

Figure 8

is shown in Figure 8 (*top*) by a Plains Indian rattle that has an engraving of Christ. A traditional Plains Indian rattle of similar form is shown in Figure 8 (*bottom*). The Christian symbolism represented by the figure of Christ engraved on the traditional type of rattle is evidence of culture change by culture contact.

From the Northwest Coast Indians of British Columbia we have an example of native techniques of carving and art style used to represent non-native forms. In

Figure 9

Figure 9 are shown Indian carvings of a white judge and a white sea-captain. The judge and the sea-captain represent a foreign culture even though they are portrayed in traditional Indian art style. And these two carvings are evidence of culture change through culture contact.

The Museum's collections contain many examples of objects (artifacts) made in the early stages of contact between Indian cultures and western European-American culture. A detailed study of these collections would provide some insight into the simpler aspects of culture change in a contact situation (acculturation).

TATTOOING—

(*Continued from page 3*)

was in a sacred condition; he was taboo. He was not allowed to touch food with his hands but was fed from a funnel-like cup. There are several well-authenticated records of European sailors receiving moko designs. These shipwrecked mariners were fortunate enough to escape the cooking pot and to be adopted into the normally cannibalistic tribe. One named Rutherford at last escaped to England where he exhibited his tattooing for profit. When the mokoed heads began to have a collector's value (period 1860–70) some post-mortem tattooing was done in New Zealand. Museum curators had to cut sections of the skin and make a microscopic examination in order to test for ante-mortem tattooing.

Expositions and circuses are never complete without a fat lady, a thin lady, and a tattooed lady. In 1914 there appeared at Earl's Court Exposition in London a woman named Queenie Morris, whose arms, legs, and body were entirely covered with tattooed designs. A Greek who described himself as the "Tattooed Man of Burma" provides the most remarkable instance of tattooing for exhibition purposes. In all, his body and limbs bore 388 figures comprising many animals, flowers, and Burmese alphabetical characters.

MOKO EXHIBIT IN MUSEUM

In Chicago Natural History Museum are two plaster face-masks and a life-sized head, each showing elaborate moko patterns favored by Maori warriors of New Zealand. The head is made of kauri gum, which is quite hard. Cases 36 and 37 in the Polynesian Hall (Hall F) contain wood carvings decorated with moko designs. Case 16 displays a moko mask and also two tattooing implements.

There is no need to leave the American continents and roam the world in search of tattooing practices. Such practices are naturally decadent under educational and missionary influences, but no doubt many examples of tattooing by puncture could be found among the older members of North American Indian tribes. At Needles, California, some twenty years ago, the writer saw old women of the Mohave Indians with considerable chin tattooing. Eskimos of Greenland, Hudson Bay, and Bering Strait have, or used to have, a peculiar and painful way of introducing pigment under the skin. The method was to blacken a fine sinew with soot from the cooking pot and pass it under the skin threaded to a fine-pointed bone needle. The chin lines for women denoted a marriageable age. There are instances of Point Barrow Eskimo men who had marks of this kind to indicate prowess in whaling. There is in ethnological publications considerable evidence to show that tattooing was widely practiced among Lillooet, Californian Indians, tribes of the Mississippi Valley, and also among the Ponca and the Omaha.

Tattooing is on the decline. But we may be sure that with a revival of military recruiting the artist will be again busy with colored inks and electric needle. There will be tattooed designs of ships, dancing girls, and hands across the sea. And the rookie will choose his designs with as much care as a woman selects a new hat in spring.

LECTURES FOR ADULTS BEGIN IN OCTOBER

The annual Autumn Course of free illustrated lectures for adults will be given at the Museum on Saturday afternoons throughout October and November. The lectures begin at 2:30 P.M. and are given in the James Simpson Theatre of the Museum. Reserved seats are available to Museum Members by arrangement in advance, either by mail request or telephone (WAbash 2-9410).

A complete schedule of subjects, dates, and speakers will appear in the October issue of the BULLETIN. The opening lecture on October 7 will be by Allan Cruickshank of the National Audubon Society, who will show natural-color motion-pictures, "Below the Big Bend," and tell the story of the Texas area recently designated as an addition to the national parks.

RARE BIRDS SURVIVE

The Annual Report of the Committee on Bird Protection of the American Ornithologists' Union, just published, contains some interesting information for the general public on rare species. The ivory-billed woodpecker that has been hovering on the verge of extinction was not on record at all in 1949, but in March of this year two of these birds were seen in Florida, a fact that indicates that the species still exists.

The California condor seems to be holding its own. Figures for the whooping-crane population show improvement, but the total is still dangerously low. The Texas population was thirty wild birds and two captives at the last count. In 1941–42 there were only twenty-two whooping cranes known to be in existence. The trumpeter swan, also thought at one time to be threatened with extinction, showed a satisfactory increase last year. There are probably well over a thousand of these birds now in existence.

—A.L.R.

For many years the School of the Art Institute of Chicago has sent students, both adult and junior classes, to the Museum to study and to sketch in the exhibition halls.

FROM ZOO TO MUSEUM

By AUSTIN L. RAND
CURATOR OF BIRDS

Some of the heartbreaks in a zoo-man's life are occasioned by the deaths of the birds he is keeping. The Chicago Zoological Society's Brookfield Zoo sends the birds that die there to the Museum. Here, depending on what material we have of the species received, we make specimens of them or save their skeletons for study. Thus many of the birds that in life delighted and edified zoo visitors, in death become part of the Museum's permanent collection, and from the study of them we learn more about birds.

An example of this is the cassowary that we received from the zoo last year. It was a moulting bird. I had recently read an extremely interesting note about moult in penguins, which compared it with that of cassowaries.

The moult of penguins is very strange indeed. The feathers appear to grow to nearly their full size under the skin of the bird. Suddenly, over large surfaces of the penguin's body, these feathers emerge, pushing out the new feathers so that whole sheets of old feathers are borne on the tips of the new incoming feathers and may come loose at once, like a fleece.

I had collected many cassowaries in the forests of New Guinea and didn't remember anything like that in them. The moulting cassowary from the zoo gave me an opportunity to solve this question. I examined the bird with interest. The new feathers did not show growth under the skin to any great extent but had pushed out through the skin as they grew; the moult did not occur in sheets over the bird's body, but scattered over the skin a gradual moult was in progress. But one point of similarity I found. The old feathers are pushed out by the new ones and may be borne on their tips, though for a short time only. Thus we get new information; little by little it is accumulated. To make this information available to other students, I prepared a short paper for a scientific bird journal, *The Auk*.

It surprises me how often specimens sent from the zoo are species new to our collection. Last month Karl Plath, the zoo's curator of birds, sent over a West African rail. Its scientific name was *Himantornis haemantopus;* its "English" name is harder still to pronounce: Nkulengu Rail, so called from its native name of Nkulengu, a rendition of its call, which has been likened to the noise of an old pump worked by a windmill. A brown and gray bird, as big as a chicken, it was the first of its species and genus to be represented in Chicago Natural History Museum.

Other institutions have similar experiences, and bird students in aviaries have found quite striking new species of birds—species not represented in any museum. One of these was a green parrot finch that Delacour and Hachisuka described from cage birds in 1936, and our expedition to the Philippines in 1945 was the first, after its description, to find the bird in its haunts and bring specimens back to any museum.

When Jean Delacour was studying birds in Indo-China, he not only collected specimens but brought back live birds for his aviaries. Among the live birds was a beautiful new pheasant, and Captain Delacour for some time after he described it had the distinction of housing a living type-specimen in his pheasant runs.

Change in Visiting Hours

On September 5, the day after Labor Day, autumn visiting hours, 9 A.M. to 5 P.M., go into effect, continuing until October 31.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Dr. Charles W. Morey, Chicago —a pottery vessel in the form of four fruits joined to a central spout, Peru.

Department of Botany:

From: Donald Richards, Chicago—383 specimens of mosses and lichens, Finland; Dr. Norman C. Fassett, Madison, Wis.—3 specimens of Callitriche, Colombia; Dr. Hugh C. Cutler, Chicago—2 Cucurbitaceae specimens, Mexico; Eizi Matuda, Mexico City—83 herbarium specimens, Mexico.

Department of Geology:

From: Dr. and Mrs. R. H. Whitfield and Jon S. Whitfield, Evanston, Ill.—694 fossil plant specimens and a fossil insect, Tennessee.

Department of Zoology:

From: Chicago Zoological Society, Brookfield, Ill.—a bird skin; Leon R. Aboulafia, Tel-Aviv, Israel—10 lizards, Israel; Lieut. (j.g.) Thomas H. Lewis, Las Cruces, N.M. —2 lizards, Mexico; F. Gaerdes, Okahandja, South West Africa—90 moths, South West Africa; J. D. Romer, Hong Kong—7 frogs, Hong Kong; Dr. Eduardo Vaz, São Paulo, Brazil—13 snake skulls and 7 snake skins, South America; Lincoln Park Zoo, Chicago —a jaguar.

Library:

From: Camp Fire Girls, New York.

Motion Pictures:

From: Baker-Hunt Foundation, Inc., Covington, Ky.—2 reels of 35mm black-and-white sound film, each about 1,000 feet.

Life is a wave which in no two consecutive moments of its existence is composed of the same particles. —*John Tyndall*

STAFF NOTES

Dr. Sharat K. Roy, Chief Curator of Geology, has left for a field trip of several weeks to collect fossil invertebrates in upper New York state. He will also visit the United States National Museum in Washington, D.C., and other eastern institutions to study their meteorite collections .... **Dr. Austin L. Rand**, Curator of Birds, has been elected a member of the International Committee, the governing and operating board for the International Ornithological Congresses. This committee, composed of 100 members chosen among the ornithologists of the world, is selected for life to obtain as broad a representation as practicable of the activities of those nations where scientific work of importance in this field is conducted .... **Karl P. Schmidt**, Chief Curator of Zoology, returned August 10 from Frankfurt, Germany, where he has been a member of the exchange group of the University of Chicago and the University of Frankfurt and Senckenberg Museum. He reports that German museums are engaged in active programs of rebuilding and that scientific work in museum fields can again be expected to flourish when buildings and collections are restored .... Governor Adlai E. Stevenson has appointed two members of the Museum staff to a committee for consultation with the state Department of Public Works and Buildings on problems involved with advancing the natural-history features of Illinois Beach State Park near Waukegan. The Governor has named **Dr. R. M. Strong**, Research Associate in the Museum's Division of Anatomy and president of the Illinois Audubon Society, as chairman of the group. **Dr. Julian A. Steyermark**, Associate Curator of the Herbarium in the Museum, is designated as a member of the committee. Serving with Dr. Strong and Dr. Steyermark will be representatives of the departments of botany of the University of Chicago and Northwestern University, the Bird Banding Association of Illinois, the Illinois Duneland Preservation Society, the Garden Clubs of Illinois, and other organizations .... **Dr. Francis Drouet**, Curator of Cryptogamic Botany, has returned from Europe after visiting various herbaria and attending the Botanical Congress in Stockholm.

GEOLOGIC PERIODS—

(*Continued from page 5*)

"epochs," corresponding to a division of the systems into "series." *Table 2* shows the divisions of two periods. Though a practicing geologist or paleontologist needs to be familiar with the epochs, it is enough for any one making a hobby of either subject to learn only the period names and to split each one into "Early," "Middle," and "Late" for further precision.

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Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

THE LAYMAN LECTURER TO RESUME SUNDAY TALKS

Paul G. Dallwig, "The Layman Lecturer," is coming back to the Museum after an absence of several years. Mr. Dallwig, whose dramatized lectures on scientific subjects on Sunday afternoons were for ten years one of the most popular public attractions offered by the Museum, will resume this activity in November.

PAUL G. DALLWIG

"Life—What Is It?" is the subject for his first four appearances to be made November 5, 12, 19, and 26. His topic on Sundays in December will be "The Caveman Knew His Way Around"; in January, "Living Races and Their Way of Life"; in March, "Behind the Scenes in Our Museums"; and in April, "The Romantic Story of the Diamond." During February Mr. Dallwig will be on a lecture tour and therefore will not appear at the Museum.

Members of the Museum may use their membership cards to attend these lectures without advance reservations. All others, except out-of-town visitors and representatives of the press, must make advance reservations to attend the Sunday lectures. Reservations may be made by mail or telephone (WAbash 2-9410). The lectures are free. They start promptly at 2 P.M. and end at 4:30 P.M., including a half-hour intermission for relaxation or for lunch or a cup of tea or coffee in the Museum Cafeteria, where smoking is permitted.

CRYPTOGAMIC PROJECT IN EUROPE COMPLETED

BY FRANCIS DROUET
CURATOR OF CRYPTOGAMIC BOTANY

For some years William A. Daily, of the herbarium of Butler University, and I have been studying thousands of specimens of the unicellular blue-green algae from all over the world. Finding that only about two dozen widely distributed species were represented among these, we began to search for and examine microscopically the original specimens of the 1,200 species described in the group since 1753. Many institutions and individuals throughout the world lent their collections to the Museum during the course of this work, and I visited at various times the many American herbaria where such original specimens were kept. At the outset of 1950, about half the total number of these original specimens had been found. They all proved to belong to the few species recognized by us in our earlier investigations or else to other groups of organisms—green, red, or flagellate algae, animals, fungi, bacteria, etc. Since so many names remained yet unexplained on the basis of their original specimens, it became evident that a trip to Europe would be necessary to hunt in the herbaria there for such specimens as might be preserved.

Through the generosity of Elmer J. Richards of Chicago, ample funds were made available for several months of travel and study in Europe during 1950. I left Chicago on April 10 and went first to London, where the facilities of the British Museum (Natural History), the Linnean Society of London, and the Royal Botanic Gardens at Kew were made available to me during a visit of ten days. Then I spent four days at the University of Birmingham and two weeks at the Muséum d'Histoire Naturelle in Paris. After that I went to Geneva for three days of study at the Conservatoire Botanique and the University of Geneva. From there I traveled to Zürich for six days at the Eidgenössische Technische Hochschule and the Botanical Garden of the university. At Vienna I spent almost two weeks studying the collections in the Natural History Museum and the Botanical Institute of the university. Then there was a week of research in Brescia, Italy, in the herbarium of the de Toni family.

I then went north to spend several days each in the Rijksherbarium at Leiden (Holland), the Botanical Museum in Copenhagen, the universities at Lund and Uppsala, and the Naturhistoriska Riksmuseet at Stockholm. I arrived in Stockholm during the preliminary sessions of the International Botanical Congress and prepared a report on the progress of this research to be read there. After a few days at the Botanical Museum in Oslo and the British Museum in London, I returned to Chicago on the first of August.

It is a pleasure to report that my visits were attended by the utmost in hospitality and assistance from members of the staffs of all these institutions. Almost all the original specimens of species described before 1860 were found and studied, and a considerable proportion of the more recently described species were likewise discovered.

THIS MONTH'S COVER

The beautiful animal on our cover is the axis deer, native to India, as represented in a habitat group in William V. Kelley Hall (Hall 17—Asiatic Mammals). This animal has recently been the subject of a controversy in Hawaii, where sportsmen's groups, who had already had it introduced on one island for hunting purposes, desired to have large numbers moved onto the main island of Hawaii. Conservationists were aroused by the hazard presented—the possible devastation of vegetation—and opposed the move, as pointed out in an article on page 5 by Karl P. Schmidt, Chief Curator of Zoology. It was especially feared that the animals would spread into the important Hawaiian National Park and destroy unique vegetation in it. The conservationists' protests were finally heeded, and the territorial government has forbidden the introduction of the animals.

DAVID J. CONWILL, 1880–1950

David J. Conwill, Captain of the Museum guard force, died suddenly while at work on August 17. He was born in London, England, October 28, 1880.

Mr. Conwill joined the guard force in 1931 and was appointed Captain on January 1, 1948. He was in active service with the United States Army from 1900 until 1930.

GEORGE WOODWARD APPOINTED

George Woodward, who joined the guard force in 1939, has been appointed to succeed Mr. Conwill as Captain of the Guard. Mr. Woodward has been a Sergeant since 1948.

TWO 1,400-YEAR-OLD MUMMIES DISCOVERED IN NEW MEXICO

Leather, Feather, and Fur Objects Found in Cave

The discovery of two 1,400-year-old mummies of prehistoric North American Indians in a dry cave inhabited by aboriginals for 2,000 or more years is reported by Dr. Paul S. Martin, Chief Curator of Anthropology and leader of the Southwest Archaeological Expedition of the Museum. The expedition concluded its season of operations late in September.

The mummies are the first positively identified with the Mogollon culture that has been under study for eleven years by Dr. Martin and his associates during a long series of expeditions. Dr. John B. Rinaldo of the Museum's anthropological staff is Dr. Martin's chief assistant. They directed the work of a large party of diggers. The mummies, most exciting find of the present season, were brought to light as the result of a switch in the expedition's operations from the excavation of buried sites of ancient communities to investigation of dry caves.

BRIDGE GAP IN KNOWLEDGE

Dr. Martin and his fellow archaeologists have been engaged on "digs" in western New Mexico for the past sixteen years. During the six seasons preceding the current one, the expedition has operated in Pine Lawn Valley near Reserve, New Mexico. In the course of this work "pit houses," America's most ancient known man-built habitations, which consist of shallow underground rooms once roofed over, have been revealed. In these and other sites the finds consisted largely of stone, shell, and bone artifacts. Perishable material of wood, basketry, and cloth had rotted centuries ago, along with the greater part of the skeletons found in burials. This lack of "dry" materials left a big gap in the information on the material culture of the Mogollon. For this reason work in the 1950 season was directed to exploring a very dry cave.

"The cave has lived up to all expectations," reports Dr. Martin. Sandals, hide, wooden objects, feather and fur cord, and a host of vegetable matter were uncovered in almost every shovelful of dust during our probing of the cave.

"The greatest and most pleasing discovery, of course, was the mummies. The shovel of one of our men, digging at a depth of about four feet, uncovered a human skull protruding from a small, shallow pit in the sandstone floor of the cave. Carefully, with paint brush and trowel, we uncovered the first mummy. A quick field analysis yielded the information that this desiccated body of a human being was an Indian who was about thirty years old when he died 1,400 years ago.

WRAPPED IN FUR ROBE

"Later, not more than five feet from the first mummy, we found a second one. This time the burial was more elaborate. Lying on a rush mat, wrapped in his fur robe, with a deerhide for a headrest, through empty

(*Continued on page 4, column 1*)

EXPEDITION DISCOVERS AMERICAN MUMMIES

Dr. John B. Rinaldo, a member of the Southwest Archaeological Expedition of the Museum, excavating one of two mummies found in Tularosa Cave near Reserve, New Mexico. The mummies are desiccated bodies of prehistoric Indians who lived in the Southwest more than 1,400 years ago.

Archaeological Expedition Recorded in Color Film

By JOHN W. MOYER

CHIEF, DIVISION OF MOTION PICTURES

Production of a film showing the work of an expedition in the field is somewhat different from making a similar type of film-story in the studio. I recently returned

AERIAL CAMERA WORK

This 30-foot tower was useful in photographing "pit houses," here hidden at base by trees.

from several weeks of field photographic-work with the Museum's Southwest Archaeological Expedition in New Mexico. This film project was undertaken to bring to the screen the finds of this particular expedition.

The most important part of expedition photography is to capture on film not only photographic images of the work of the expedition and the results of such work, but also scenes of the country, camp life, activities, wildlife, and other related subjects that will give a continuity to the completed film-story. This is not always an easy task because often we are "shooting off the cuff," which is slang for saying we have no prepared script to follow and are photographing each scene as it occurs. Then at a later date in the Museum we have to put the sequences in related form to build up the story as it happened.

Today, with world-wide use of semiprofessional color-film and the layman's desire to see almost all subject matter in natural

(*Continued on page 4, column 1*)

NEW MEXICO MUMMIES—

(*Continued from page 3*)

eye sockets a prehistoric Indian saw light again after 1,400 years of darkness.

"Dried in the dust of ages, these desiccated bodies will prove very helpful to the physical anthropologists who seek to piece together the puzzle of human development. Not only the bones but even the hair, skin, nails, and teeth are preserved. These are the first mummies positively identified as Mogollon. Their discovery marks an important step in our knowledge of this culture.

LIGHTING WAS A PROBLEM

Flares beginning to light up the interior of the cave where the mummy sequence was filmed by John W. Moyer of the Museum staff.

"The digging was terrifically dusty, and masks and goggles had to be worn every minute. The dust is so thick in the cave that one cannot see his hand before his face."

Among other things yielded by the cave, Dr. Martin reports a fur and feather robe, an atlatl or throwing stick, cloth, pieces of matting, arrow shafts, quantities of rope and string, a wooden spoon, a hank of human hair presumably saved for weaving, winter moccasins with fur lining, a human figurine, baskets, many unfired pieces of pottery, and hoarded supplies of beans in the pod, corn kernels, and squash seeds.

"We have also found what appears to be martini cocktail olive sticks—only these are hardwood sticks with juniper berries that have been speared, for what purpose we do not know," Dr. Martin reports.

EXPEDITION MOVIES—

(*Continued from page 3*)

color, the expedition photographer finds himself confronted with many obstacles, chief among them correct exposures. On this expedition, the discovery of two prehistoric mummies of early North American Indians at once took preference over other subject matter, and all efforts were directed toward making a complete motion-picture story of this important discovery. The mummies were unearthed about thirty-five feet inside a large cave near the top of a mountain miles from base camp. The location made it impossible to use the type of lighting equipment for color work with which we would normally "shoot" such a sequence, and so we had to rely on photographic flares as a source of all light. While such lighting is not the most desirable type for color work, we were successful in obtaining actual scenes of the discovery, digging out, and removing of these mummies deep in the interior of the cave as well as other material and artifacts found there.

Another sequence needed in the film was to show the work being carried on with "pit houses." This was best done from an angle above the "house," and to get these scenes we utilized the expedition's 30-foot sectional steel tower, which could be transported by truck to the edge of the "house" and assembled easily in approximately twelve minutes. Of course it was necessary to hoist all camera equipment to the top of the tower many times before all scenes were completed. All these scenes show from the best angle from beginning to end the finding of "pit houses" and the work on them.

Also filmed with these color sequences were other related scenes. All of them will be incorporated in a new lecture-film, now in production, for the Department of Anthropology.

Technical Publications Issued

The following technical publications were issued by Chicago Natural History Museum recently:

Fieldiana: Anthropology, Vol. 36, No. 5. *An Analysis of Culture Change in the Ackmen-Lowry Area.* By John B. Rinaldo. July 14, 1950. 14 pages, 2 text figures. $0.25.

Fieldiana, Zoology, Vol. 31, No. 36. *Bats from New Caledonia, the Solomon Islands, and New Hebrides.* By Colin Campbell Sanborn and A. J. Nicholson. August 31, 1950. 26 pages, 6 text figures.

Fieldiana, Zoology, Vol. 31, No. 37. *A Study of the Spotted Tinamous, Genus Nothura.* By Boardman Conover. September 8, 1950. 24 pages.

Fieldiana, Zoology, Vol. 31, No. 38. *A Study of the Elegant Tinamous, Genus Eudromia.* By Boardman Conover. September 8, 1950. 12 pages.

STAFF NOTES

Eugene S. Richardson, Jr., Curator of Fossil Invertebrates, has returned from western Wyoming, where he collected several hundred specimens of fossil invertebrates not hitherto represented in the Museum collections .... **Dr. Fritz Haas,** Curator of Lower Invertebrates, and **Joseph B. Krstolich,** Artist, have returned from Bermuda, where they made undersea studies of the brackish water fauna for future exhibits of marine invertebrates .... **Dr. Austin L. Rand,** Curator of Birds, was invited to accompany a party from the Armour Livestock Bureau on an aerial tour of the northwestern states as the representative of the Museum. He will have an excellent opportunity to study many aspects of the livestock industry. The party left Chicago on September 10 .... **Dr. Julian A. Steyermark,** Associate Curator of the Herbarium, and **Dr. Theodor Just,** Chief Curator of Botany, attended the annual meetings of the American Institute of Biological Sciences, held in Columbus, Ohio, September 11 to 13. Dr. Steyermark is secretary of the Systematic Section of the Botanical Society of America, and Dr. Just is secretary of the Society for the Study of Evolution. Dr. Just presented a paper entitled "Citation of Specimens in Cyto-taxonomic Literature" before the Systematic Section of the Botanical Society of America; he also presented a paper before the Society for the Study of Evolution entitled "Fossil Cycads and their Evolutionary Significance."

OCTOBER LECTURE TOURS, DAILY EXCEPT SUNDAY

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Fri., Oct. 6—Jewelry—Precious and Costume. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Oct. 11—World Harvests—The World's Food Supply (*Miriam Wood*).

Fri., Oct. 13—Color in Nature. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Oct. 18—Meet the Mammals (*Lorain Farmer*).

Fri., Oct. 20—Story of the Dunes. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Oct. 25—Fossil Facts (*Anne Stromquist*).

Fri., Oct. 27—Masks—Not for Halloween. Illustrated introduction in Meeting Room (*June Buchwald*).

ANIMAL INTRODUCTIONS UPSET CONSERVATION

By KARL P. SCHMIDT
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

No biological phenomenon is more familiar to the general public than the calamitous spread of foreign species of animals and plants introduced into a new country either by design, as in the case of the European rabbit in Australia and New Zealand and the "English" sparrow in our own country, or by accident, as has been the case with most of the plants known to us as weeds and with many destructive insect pests. Some such introductions have produced spectacularly disastrous results and have called forth the most urgent and stringent measures to exterminate or to "control" the introduced animal.

A case in point was the recent proposal to introduce the Indian axis deer as a game animal into the island of Hawaii. This deer had already been introduced in the smaller Hawaiian island Molokai. On the larger island, with the certainty that it would invade the Hawaii National Park, the proposal met with such active protest from conservationists and biologists generally that it has been abandoned.

What success such an introduction will have is always unpredictable. An innocuous-seeming plant or animal may produce the most unexpected results. The introduction of the South American water-hyacinth in Florida as an ornamental plant, with its subsequent rapid spread, now costs the State of Louisiana, for example, millions of dollars to keep waterways open. The ordinary sheep ranch of some 20,000 acres in southern New Zealand must employ a full-time rabbit catcher. No danger could have been foreseen in the introduction of the graceful Alpine chamois into the mountains of New Zealand, but its success there has made it an enemy of the sheep rancher, since its trails at high altitudes promote the downward creep of the mountain shale and make it impossible to re-establish grasses on the over-grazed slopes. It is such instances that made the Hawaiian conservationists wary of permitting introduction of the axis deer.

CONTROL BY NATURAL FOES

On the other hand, many introduced animals and plants that have become imimportant economic pests have been brought under control by introducing their natural enemies. Sometimes this may not work at all. The European red fox introduced in Australia turns its attention to the native animals and appears to make no impression at all on the excessive rabbit population. Experience everywhere in the world has been against the introduction of the mongoose to destroy rats or exterminate poisonous snakes; it turns out that the mongoose much prefers ground-nesting birds and domestic poultry.

On the success side of the ledger, a pair of cactus-eating insects brought the vast and growing acreage of introduced American prickly pear under control in Queensland; this was a kind of poetically just repayment for the Australian ladybird beetle, which was introduced in Californian orange groves as the most effective of the controls of the cottony cushion scale insect. Such "biological control" forms one of the main segments of the important practical field of economic entomology, in which the romantic search for specific insect predators vies in interest with the work of the "pure science" entomologist.

THE POTATO BEETLE CASE

The extraordinary accusation in the Russian press in the summer of 1950 that American authorities had engaged in "biological warfare" in distributing the Colorado potato beetle in the Russian zone of Germany reflects the phenomenon of sudden appearance of great numbers of these beetles, a phenomenon sufficiently familiar to every gardener in this country but perhaps less so to gardeners in eastern Europe, where the potato beetle is only now arriving, after a steady march across France and Germany since its introduction at Bordeaux during World War I. Relatively few animals and plants from the Americas have been successful in Europe and Asia, whereas introductions in the contrary direction are legion.

Without further elaborating the instances of calamitous results of introductions with inadequate knowledge of the results to be expected, it is evident that biologists and conservationists have reason to be acutely aware of the dangers of such introductions.

Arkansas Field Trip

Field work to make a survey of the mammals of Arkansas was resumed late in September when Curator of Mammals Colin C. Sanborn left on a month's tour of that state. The work, begun in 1948, was interrupted by the Rush Watkins Zoological Expedition to Siam in 1949.

It is planned to work in the southern part of Arkansas, a region never before visited by mammalogists, all previous work having been done in the Ozark Mountains in the north. Curator Sanborn will co-operate with Dr. John A. Sealander, of the Zoology Department of the University of Arkansas, Fayetteville, who is developing special studies on Arkansas mammals.

Atom-Bomb Defense Plan Meetings at Museum

The facilities of the Museum were used from September 25 to 29 for day and night sessions of federal and municipal officials who met to analyze and criticize Chicago's plans for defense in case of an atom-bomb attack.

CHILDREN'S MOVIE SERIES ON SATURDAY MORNINGS

The Autumn Series of free motion pictures for children on Saturday mornings will begin October 7 and continue weekly through November 25. The eight programs are presented under the auspices of the James Nelson and Anna Louise Raymond Foundation in the James Simpson Theatre of the Museum. All of the programs start at 10:30 A.M. On two programs there will be personal appearances by the explorers who made the films. On October 7, Allan Cruickshank, of the National Audubon Society, will tell the story of his adventures in Big Bend National Park, Texas. Murl Deusing, of the Milwaukee Public Museum, will be the storyteller on October 21, with films showing an animal hunt in Africa.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are needed.

Following is an outline of the programs:

October 7—BIG BEND ADVENTURE

A color movie of a spectacular Western wilderness of 1,100 square miles—the Big Bend National Park in Texas

Talk by Allan Cruickshank, National Audubon Society

October 14—PACIFIC ISLAND

Life on a typical island in the Pacific area

Also a cartoon

October 21—SAFARI IN AFRICA

Big game and primitive people of Central Africa

Talk by Murl Deusing, Milwaukee Public Museum

October 28—EARLY WESTERN EXPLORERS

The travels and adventures of Fremont and of Lewis and Clark as they opened up the wild West

Also a cartoon

November 4—INDIA

A story of life on a farm and on a tea plantation

Also a cartoon

November 11—NATURE'S KALEIDOSCOPE

John Kieran's stories of actual happenings in nature, "stranger than fiction"

November 18—JAPAN

How Japanese city and farm families live

Also a cartoon

November 25—THE CIRCUS

The whole circus story from the unloading of the tent and animals to the big-top show

Also a cartoon

Nature is never more perfect than in small things. —*Pliny*

ANIMAL PHOTOGRAPHY EXHIBIT IN OCTOBER

"ANIMALS IN ACTION," a photographic exhibit unusual because the photographer has made technique secondary to authenticity in representation of nature, will be placed on display in Stanley Field Hall on October 1. The special exhibit will continue through October 31. The pictures, numbering 48, are the work of Dr. Roman Vishniac, a zoologist who has specialized in "hunting by camera."

Dr. Vishniac's photographs are candid snapshots of animals, for the most part of difficult subjects such as small insects rather than large and spectacular birds and mammals. The creatures are neither dead specimens arranged by the photographer nor live ones induced to pose; they are animals pursuing their normal routines of living. Dr. Vishniac takes nature as he finds it, in normal activity and surroundings. He disapproves of the methods generally used by nature workers, who frequently kill, chloroform, or otherwise incapacitate such subjects as butterflies and beetles in order to photograph them under ideal photographic conditions.

PENGUIN SWIMMING

One of Dr. Roman Vishniac's photographs of "Animals in Action," on exhibition in October.

"Such measures are not only a needless waste of animal life," he says, "but actually give an unreal idea of the subject photographed. When a photographer pins up a doped butterfly, we see it merely as a dead thing whose beauty we enjoy only as we might admire the pattern of a carpet. But when we photograph the living butterfly as it moves about at will, although the effort might take three or four hours of patient waiting, the result is a true report of an incident in a butterfly's life."

Dr. Vishniac's photographs have been exhibited at the American Museum of Natural History in New York and elsewhere. Russian-born, Dr. Vishniac is a comparative newcomer to America. His attitude against captivity for living things has a philosophical basis wrought from events of his own life. One of millions of victims of the social upheavals caused by wars in Europe, he has been in Russian, German, and other European prisons and concentration camps eleven times. He first was forced to flee from Russia to Germany. With the rise of Hitler he moved to France in 1939 and then had to flee to America following the fall of France in 1940.

ILLINOIS AUDUBON SOCIETY —HISTORY AND PURPOSE

BY C. O. DECKER[1]

The Illinois Audubon Society transferred its office in 1949 to Chicago Natural History Museum, from which its activities are now directed. Its lectures are now held in the James Simpson Theatre of the Museum. A short history of the Society is presented here for the benefit of Museum members. A fuller account of the early history, by Mary Drummond, appeared in the fall number for 1920 of the *Audubon Bulletin*. The first three paragraphs of this article are based on it.

Probably the first concerted move toward the protection of birds in Illinois was the formation of a class of nine boys in Oak Park, Illinois, under the guidance of Rev. George S. Pratt. This was in 1886, in connection with the Forest and Stream organization.

In 1890, "a Chicago Society" [2] was started under the presidency of Mrs. E. Irene Rood, and it was incorporated in 1893 with about 70 members. Its most important accomplishment was to inspire and largely manage the "Audubon Congress" [3] held in Chicago in October, 1893, during the World's Columbian Expedition. Mrs. Rood's work took her away from Chicago, and, after a life of about four years, the Society's activity ceased.

AIMS FORMULATED

In 1896 and 1897, another strong movement toward bird protection started. Through the efforts of such bird lovers as Mrs. Sara A. Hubbard, Mrs. John V. Farwell, Jr., Ruthven Deane, Rev. George H. Pratt, Edward B. Clark, and others, work was organized. On April 1, 1897, eight years before the establishment of the National Audubon Society, the Illinois Audubon Society, the fourth of the state societies, was incorporated with the following aims and principles: (1) To encourage the study of birds, particularly in the schools, and to disseminate literature relating to them; (2) to work for the betterment and enforcement of state and federal laws relating to birds; (3) to discourage the wearing of any feathers except those of the ostrich and domestic fowls; (4) to discourage in every possible way the wanton destruction of wild birds and their eggs.

These aims have been broadened through the years to include conservation in its various aspects, encouraging the formation of wildlife sanctuaries and opposing all efforts to infringe in any way upon the state and national parks.

Mrs. Henry W. King as president and Miss Emily S. Rumsey as secretary-treasurer took the reins of the new Society and at the first annual meeting in 1898 reported a membership of 580 adults and 2,800 juniors.

To "disseminate literature" was very early taken to include illustrated public lectures, sponsored by the Society, the first having been written by Mr. Clark, illustrated with slides, and delivered by Mrs. Farwell in 1902. Henry Oldys was engaged for a series of lectures through the state in the fall of 1913, and on a four-week tour spoke in sixty-four towns to more than one hundred audiences and 30,000 people. In the spring of 1914 he made another tour on which he spoke before fifty-seven audiences of 13,000 people in thirty-two towns. Moving pictures were beginning to gain popularity, and in 1917 Orpheus M. Schantz found a way to reach a movie audience in Sheffield when he persuaded the theater owner to sandwich an hour's bird talk between two of his reels. Recently, for several years, the Society has been cooperating with the National Audubon Society by using its screen tours for an annual program.

SUCCESS IN LEGISLATION

The Society was active in 1912–13 in support of federal action on a migratory bird law that was passed in the last days of the congressional session and signed by President Taft only a few hours before his retirement. A bill prohibiting the importation and sale of wild-bird feathers was up at about the same time, and in 1916 it was announced that all feathers of wild birds had been withdrawn from sale by Chicago stores.

The first *Comprehensive Check List of the Birds of Illinois*, one of the many contributions to the Society by Benjamin T. Gault, for many years an active member of the board of directors, was issued in 1922. A revision of this valuable work is now being prepared.

Spring outings were a regular activity of the Society for many years, beginning in 1924 with a day spent along the Des Plaines River south of Riverside. In 1940, the first of several meetings in cities other than those immediately around Chicago was held at Havana, Illinois, with the co-operation of the Illinois Natural History Survey. Other sessions were held at Quincy, Savanna, Springfield, and Urbana. Gasoline rationing in the war years interfered with that program, but its resumption is now under consideration. Bird walks in Lincoln Park,

1. Treasurer of the Illinois Audubon Society for twenty years and editor of its bulletin for ten years.
2. The "Chicago Society" was undoubtedly the organization known as the "Women's Committee of the World's Coogress Auxiliary on Ornithological Congress."
3. The "Audubon Congress" was probably the "World's Congress of Ornithology" held October 18–21, 1893, at the World's Columbian Exposition.

Chicago, have been conducted every spring since 1940 under the leadership of Miss Doris Plapp and, the past two springs, in a few other Chicago parks with other leaders.

Meetings of the Society were held in various places until 1912, when the secretary's report noted that "part of our work has been carried on at the Chicago Academy of Sciences for several years . . . and our headquarters will hereafter be in that building." A change in the by-laws of the Academy was made, permitting a somewhat closer association, and in 1930 a formal affiliation with it as the "Section of Popular Ornithology" was accomplished. From that time all lectures and other public meetings were held there until the removal of the Society to Chicago Natural History Museum in 1949.

PERIODICAL ESTABLISHED

Seeking a closer contact with the membership, well distributed over the state as it was, a regular publication was thought desirable. The first number of the *Audubon Bulletin* was issued in 1916. This was continued with annual and semiannual numbers until it was made a quarterly in 1939, a total of seventy-five numbers having now been issued. Many famous ornithologists have been among its contributors, and a Christmas census report has been a regular feature.

At the annual meeting in 1898, Ruthven Deane was elected president, which position he held with great honor and benefit to the Society until 1914. He was succeeded by Orpheus M. Schantz (1914–30), Prof. C. W. G. Eifrig (1930–41), and Dr. R. M. Strong, Research Associate in Anatomy at Chicago Natural History Museum, who is the present president.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Robert M. Ransom, Oak Park, Ill.—a drum of wood with hide head, Choco Indians, northwest Colombia.

Department of Botany:

From: Dr. Earl E. Sherff, Chicago—1,987 herbarium specimens, Hawaii; William H. Hathaway, Waialua, Oahu, Hawaii—102 herbarium specimens, Hawaii; Dr. George D. Fuller, Springfield, Ill.—65 herbarium specimens, Illinois; United States Department of Agriculture, Division of Plant Exploration and Introduction, Plant Industry Station, Beltsville, Md.—a specimen of *Quillaja saponaria* bark, Chile; Dr. Lulu O. Gaiser, Cambridge, Mass.—4 herbarium specimens of *Liatris*, North Carolina.

Library:

From: William J. Beecher and A. L. Myrland, both of Chicago.

KOREA COLOR-FILM FEATURED IN LECTURE COURSE

On Saturday afternoons throughout October and November the Museum will present its annual Autumn Course of free illustrated lectures on travel and science. The lectures will be given in the James Simpson Theatre of the Museum and all will begin at 2:30 P.M. The lectures will be illustrated with motion pictures in color.

Of special current interest will be the October 14 lecture, "Korea Divided." Those who wish to see the films on Korea and hear this lecture are advised to make reservations especially early because an exceptional demand is anticipated.

Limited accommodations make it necessary to restrict these lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lecturers:

October 7—BELOW THE BIG BEND
Birds and other wildlife in southwest Texas
Allan Cruickshank

October 14—KOREA DIVIDED
Modern story of an ancient people
Colonel Homer C. Kellems

October 21—CANOE COUNTRY
A Canadian wilderness adventure
Murl Deusing

October 28—THE ETHIOPIAN STORY
Peoples, customs, and recent development
Frederic Christian

November 4—COLUMBIA RIVER COUNTRY
Biography of a mighty river from source to sea
Francis R. Line

November 11—YUCATAN
Ancient ruins and modern life in Mayaland
Roy A. Whipple

November 18—OUR FABULOUS GREAT LAKES
A pictorial study in economic geography
Clifford J. Kamen

November 25—DUTCH GUIANA PORTRAIT
Peoples of a colonial jungle outpost
Robert Leighton

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:25 o'clock on the lecture day.

Baby Gorilla Received

The relation between the Chicago Zoological Society and Chicago Natural History Museum frequently brings valuable and unusual specimens of animals to the Museum's collections as result of a loss by death at the Brookfield Zoo. A most unfortunate recent loss, the death of the baby gorilla "The Baby," brought the body of this infant to the Museum. The scientific interest of juvenile animals is often very considerable. Adequate knowledge of any species includes a knowledge of the changes from birth to maturity and old age. Thus the Museum is gradually adding to its collections of juvenile animals, some of which are especially valued for exhibition.—K.P.S.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The paleontological collections exhibited in 1900 in the Museum's first building in Jackson Park were derived almost entirely from the original collection purchased from Ward's Natural Science Establishment. These, with the mineral collection from the same source, formed the nucleus on which the Museum's growth in these fields has been based.

The Ward collection included many fine individual fossils, some of which have been subjected to renewed careful study in recent years. The restorations from the Ward collection have all of necessity been replaced. The visitor may compare the new methods of restoration in Ernest R. Graham Hall (Hall 38) with the Hall of Paleontology in the early days of the Museum in our illustration.

Hall of Paleontology—Style of 1900

MINERALS FROM COLOMBIA

An excellent collection of examples of many minerals found in Colombia, comprising a total of 140 specimens, was presented September 1 to Chicago Natural History Museum on behalf of the Colombian government by Joaquin Gutierrez, the South American nation's consul in Chicago, and Mrs. Gutierrez. Stanley Field, President of the Museum, received the presentation on behalf of the Museum. Also present were John R. Millar, Deputy Director, Bryan Patterson, Curator of Paleontology, and Robert K. Wyant, Curator of Economic Geology, of the Museum, and José V. Arbelaez, Vice Consul.

A GIFT FROM COLOMBIA

Presentation to the Museum of notable mineral collection by Joaquin Gutierrez (third from left), Consul of Colombia in Chicago. The ceremony was held in the office of Stanley Field (fifth from left), President of the Museum. Others present (left to right) were Jose V. Arbelaez, Vice Consul; Mrs. Emilia Gutierrez, wife of the Consul; Robert K. Wyant, Curator of Economic Geology; John R. Millar, Deputy Director of the Museum; and Bryan Patterson, Curator of Fossil Mammals.

The collection includes both precious minerals such as gold and minerals of industrial importance. It was displayed at the recent International Trade Fair held in Chicago on Navy Pier.

In making the presentation, Consul Gutierrez read the following message to Mr. Field:

"It is an honor for me to present to you, as President of the Board of Trustees of the Museum of Natural History of Chicago, the collection of minerals which Colombia sent to be exhibited at the first United States International Trade Fair of this city. It is a double honor for me because I am placing this gift in the hands of a man who is one of the most important sons of this city, the promoter and sustainer of this Museum, and because this collection of minerals and stones proceeded directly from the soil of the Colombian Andes and their arrival here in Chicago represents a proof of friendship and good will between my country and this great country of the United States. This collection represents the heart of our land where my country feels faith in the friendship and strength in the liberty of a democracy."

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

GRAY'S MANUAL OF BOTANY, Eighth (Centennial) Edition—illustrated. Largely rewritten and expanded by Merritt Lyndon Fernald. American Book Company, New York. lxiv+1,632 pages, 1,806 text figures. Price $9.50.

Friend and constant companion of generations of botanists, *Gray's Manual of Botany* is a classic of botanical literature. In its new format and increased size, it is eloquent testimony of the author's life-long labors devoted in large measure to the revision of the seventh edition (1908). The extent of this task is best illustrated by some comparisons. The number of species, varieties, and named forms described has been almost doubled from 4,885 to more than 8,000, whereas the number of pages has been increased from 926 to 1,632. The larger range selected for this edition and the greater number of species and subspecific entities included brought about not only these obvious changes in size and format but necessitated the reworking and rewriting of most descriptions, keys, distribution data, and other pertinent information. Graciously the author acknowledges the assistance of some 400 active correspondents, aid derived from monographic studies of other botanists, and the textual contributions prepared by several specialists.

Other important changes and improvements are seen in the addition of many excellent figures, especially of difficult groups, the replacement of the old synoptic keys by dichotomous ones, the expansion of new keys for the identification of different developmental stages, the explanation of scientific names, the revised summaries of families, genera, and species included, and detailed indexes to common and scientific names. The new treatment of the genus Salix, for instance, covers 32 pages, half of which are keys for identification, whereas the other 16 are used for the descriptions of the 54 species recognized. The vast number of species of hawthorns described since the seventh edition has been reduced to 103 numbered species and some unnumbered entities, cultivated forms, and putative hybrids. However, these extensive changes, improvements, and additions did not materially affect the organization of the book or its "philosophy," as is apparent from the continued use of the Engler-Prantl system of classification and the application of the International Rules of Botanical Nomenclature.

The inevitable changes of certain familiar names are not merely the outgrowth of the strict application of the International Rules. In many instances they are the result of extensive studies of the types of these species deposited mostly in European herbaria and checked in preparation of the manuscript of this edition. For this reason, the new names should ultimately bring about greater stability.

Chicagoans are admonished to look again for the minute plant *Thismia americana* found only once in low prairies in Chicago. Member of an essentially tropical family, this "most remarkable species" is one centimeter high or less and has its nearest relative in Tasmania and New Zealand. It is unquestionably the rarest species of all those included in the *Manual*.

All in all, the new *Manual* is a masterpiece of botanical taxonomy, incorporating the best tradition and the tested results of the author's research and judgment.

THEODOR JUST
Chief Curator of Botany

AUDUBON LECTURES

The Illinois Audubon Society again will present five lectures in the James Simpson Theatre of the Museum during the forthcoming season. These lectures are illustrated with moving pictures in color and deal with wild life, especially birds.

The first lecture will be by Carl W. Buchheister on "Wild Life Down East," at 8 P.M., Monday evening, November 27. Mr. Buchheister is vice-president of the National Audubon Society and director of the Audubon Nature Camp in Maine. The Theatre will be open at 7:30 P.M.

NEW MEMBERS

The following persons became Museum Members between August 14 and September 15:

Non-Resident Life Members

George W. Dulany, Jr.

Associate Members

Laurence A. Carton, Mrs. Helen Horton

Annual Members

E. E. Bachman, R. H. Bacon, E. C. Barker, P. J. Bauman, John C. Brennan, O. W. Clifton, Robert S. Foster, Fred F. Gardner, Sigwald C. Grunlee, Miss Julia Kavanaugh, Mrs. Albert J. Lindar, Dr. Wolfgang Masur, John W. McCracken, Kenneth McCracken, R. C. O'Hair, James P. Quam, Dr. William Wilson, Harry L. Zimmer.

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Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

From the *Annual Report of the Director* for the year 1900:

The Curator of Anthropology says: The event of unusual importance has been the additional interest manifested in the department by the gift of Mr. Stanley McCormick of $5,400 for the purpose of making more complete the Hopi exhibit. Under this fund four expeditions have been undertaken. Assistant [J. A.] Burt spent December and January in the exploration of several Hopi ruins along Little Colorado River, Arizona, and as a result the exhibits showing the ancient life of the Hopi have been increased by over 300 fine specimens of pottery, bone, stone, shell, and textile fabrics. Part of this collector's time was spent in examining ruins hitherto not represented in scientific museums, and while the full significance of his discoveries is not yet determined, it is safe to say that new factors have been added to our knowledge of the early movements of certain Hopi clans. The second McCormick expedition was that of the Curator [Dr. George A. Dorsey] and Mr. [H. R.] Voth in December to six of the Hopi pueblos, at which time notable additions were made to the collections illustrative of the modern life of their occupants. While these additional specimens cover nearly every phase of activity, of special interest are the series of rare dolls, masks, prayer-sticks and pipes. The third McCormick expedition was in charge of Assistant Burt, who spent two months in completing investigations begun earlier in the year on the lower Little Colorado River, Arizona. As a result of this expedition a large amount of material was added from graves and house ruins of the prehistoric Hopi, thus extending the collections into a hitherto unexplored region. The fourth McCormick expedition was in charge of Assistant [Charles L.] Owen, who left Chicago early in May and is at present in the field, it being expected that he will not return until early in December. The object of this McCormick expedition is to make a careful and extensive exploration of about fifteen Hopi ruins, eight of which have never before been disturbed.

BENJAMIN BRIDGE, 1870–1950

Benjamin Bridge, veteran employee of the Museum who had been in the institution's service continuously since 1897, died on October 22. Mr. Bridge was born January 2, 1870, in Ripley, Derbyshire, England. He began his fifty-three years on the Museum staff as a clerk and subsequently was promoted to business-office work. In 1921 he was appointed Auditor and continued in that important position until his official retirement on December 31, 1947. Despite his retirement, he remained in active service with the Museum as Auditor Emeritus until his death. His years of service with the Museum exceeded those of any other individual.

A DESERVED REBUKE TO LAZY RESEARCHERS

I wish that college teachers . . . would exert themselves to end an annoyance that is becoming an outrage. At least twice a month graduate students write to me asking me to make bibliographies for them. Not to criticize or amplify bibliographies they have made, or to name sources I may know about which they have missed, but to do the job for them. What goes on in the graduate schools? The republic of learning imposes obligations on its citizens and a basic one is that they must put their scholarship at the disposal of one another. Any of them is free to call on any other for help and can confidently expect it. But no one needs help until he is in trouble and a bibliography is what you start with. It's your job, you make it yourself. The first step is not to write to someone saying, "I'm beginning a research on this or that; where will I find material?" The first step is to go to the library and wear out shoeleather and the seat of your pants till you are sure you can't find anything more by your own efforts. The graduate student who asks someone else to do his work is not only revealing a lot about himself, he is revealing something about his instructors too and about this training in research that my betters tell me is so precious.

BERNARD DE VOTO, in *Harper's Magazine*

THIS MONTH'S COVER

Bald cypress (*Taxodium distichum*) is found in deep swamps, on wet stream banks, and in bottomlands throughout the lower Atlantic coastal plain, the Gulf, and the Mississippi Valley region as far north as southern Illinois and Indiana. Like the dawn redwood of China, the bald cypress sheds not only its small needles in the fall but also the branchlets bearing them. The trees with their characteristic "knees" shown in the cover photograph, taken by Dr. Theodor Just, Chief Curator of Botany, are growing on the shore of Reelfoot Lake, northwestern Tennessee. This lake, formed by an earthquake in 1811–12, is eighteen miles long and several miles wide. It is entirely surrounded by bald cypresses. Navigation is exceedingly difficult and possible only along marked channels because thousands of old cypress stumps are concealed just below the surface of the water. This photograph is one of many illustrations seen in "Natural Landscapes of the United States" by J. Francis Macbride, published by the Museum as No. 27 of the Popular Series in Botany.

BIOLOGY AND MEDICINE

How general the pursuit of research in the biological sciences was among medical men a hundred years ago is well shown by the following quotation:

"Whilst professional knowledge should undoubtedly be the first object of the Physician's studies, general science should not be neglected, and is so far from being incompatible with that primary object, that it cannot fail to enlarge your views and give efficiency to your professional researches. So intimate is the connexion between every object of useful and scientific inquiry, that there is hardly one branch of knowledge which does not in some measure throw light and illustration upon others."—*Sir A. Cooper, Lecture on Surgery.* From the title page of *Medical and Physical Researches . . .*, by Richard Harlan, M.D., 1835.

LANDSCAPES OF THE U.S. FROM THE VIEWPOINT OF A BOTANIST

Condensed by THEODOR JUST
CHIEF CURATOR, DEPARTMENT OF BOTANY

"The great naturalist Darwin said that every traveler ought to be a botanist, because plants make up a large part of every landscape. Certainly if the traveler knows something about the vegetation of the scene he views, his interest and enjoyment are immeasurably increased." With these words J. Francis Macbride, Curator of Peruvian Botany, begins his profusely illustrated travelogue, *Natural Landscapes of the United States*, to be published early in November by the Museum as "Popular Series, Botany, No. 27."

First the traveler is introduced to the botanical division of the United States, which can in the most general way be based on the three main types of natural vegetation that everyone recognizes: namely, woods, grassland, and desert. These vary greatly in appearance with the kinds of trees and other plants that predominate in any given area; furthermore, they often merge with one another. Some of the more conspicuous variations of the three types of vegetation will be characterized by naming a few, a very few, of the plants that comprise them—in the main only the trees or other plants so striking and large that they may be seen from a moving automobile.

"The sightseeing trip through the eyes of a botanist" begins with a brief account of the forests, once covering a large part of our country but now much more limited and often protected by state or federal laws as part of our national heritage. These forests are of two principal kinds: *coniferous* (trees that bear cones and usually have needle-like evergreen leaves) and *deciduous* (trees that lose their broad leaves completely at some seasons, becoming entirely bare). Although the leafy or broad-leaved trees may be evergreen in the subtropical areas, coniferous and deciduous forests are in many places more or less mixed.

CONIFEROUS FORESTS

Of the coniferous forests three rather distinct geographical types are recognized. The largest area is occupied by the northern coniferous forest, known in frontier folklore as having been the home of Paul Bunyan and his fabulous Blue Ox. This forest sweeps across Canada from Alaska to the Atlantic, extending, a little west of the Great Lakes, into Minnesota and Wisconsin and as far south as central Michigan, thence eastward through Pennsylvania and upper New York to the St. Lawrence. South of this area it merges with the deciduous forest that originally clothed the Ohio and Mississippi River valleys, and together they form a distinctive, if narrow, belt of mixed timber.

The Atlantic and Gulf Coastal Plain forests extend roughly from Long Island to Florida and along the Gulf of Mexico to a few hundred miles beyond the delta of the Mississippi and are characterized by nearly pure stands of pines, southward especially longleaf and slash pines.

But the greatest expanse of coniferous forests in this country is found in the West. Several pines and spruces, the hemlock, the great fir, and the canoe cedar range from Alaska and western Canada southward nearly throughout the Rocky Mountains and along the coasts of Washington, Oregon, and California to the Sierras.

JOSHUA TREES IN ARIZONA DESERT
Yucca brevifolia reproduced by courtesy of Susan Delano McKelvey in J. Francis Macbride's "Natural Landscapes of the United States."

DECIDUOUS FORESTS

Let us now . . . continue our journey through the deciduous forest, especially the great hardwood forest of the east-central United States. It extends approximately from the New England states to the Mississippi, or slightly beyond, and southward to eastern Texas. Although the deciduous forest was originally very extensive, it was later largely cut down to make room for farming, except for some sizable tracts. The woods that most Americans probably know most intimately are the small remnants of this forest, most commonly seen as farm woodlots throughout the East and the Midwest. The commonest trees are oak, hickory, pignut, maple, beech, walnut, ash, birch, red or sweet gum, locust, linden and sycamore, in former times the chestnut, and southward the tulip tree.

In the states bordering the west bank of the Mississippi River, from Minnesota to Texas, the transition from the Midwestern woods to the Great Plains and Prairies is marked by poplars and cottonwoods, especially along the streams, or by oaks interspersed with much grassland.

The traveler to Florida finds the predominantly sandy soil of the peninsula covered with a vegetation continuous with that of the southern coastal plains, consisting of southern pine, live oak, cypress, and cabbage palms, and frequently marked by Spanish moss growing on trees. Citrus groves and rows of planted Casuarinas, so-called Australian pines, furnish an exotic touch. As the tip of the peninsula is approached, a different type of vegetation appears, consisting of West Indian elements, such as gumbo-limbo, satinwood, fiddlewood, figs, and stoppers, with royal and thatch palms on limestone soils, seagrape and sea lavender along the beaches, and mangrove swamps along muddy shores. The many tropical plants encountered, such as the poinsettia or Christmas flower, the poinciana, the Bougainvilleas, the so-called crotons, are, of course, introduced, as are the coconut and other exotic palms.

GRASSLANDS

As we journey across the country anywhere between Canada and Texas, from one forest area to the other, we must pass through a broad belt of open land. The Prairie and Great Plains states from the Dakotas to Texas are the natural grasslands of North America and represent a characteristic American landscape. Originally covered with grasses and herbs, they supported herds of antelope and buffalo, the latter in numbers that now seem fantastic. The true prairie lacked trees, except along the larger streams.

In the basin west of the Rockies, the so-called steppes with which the prairie merged pass into semidesert areas characterized by a mixture of low shrubs, grasses, and other herbaceous plants. In the northern part of these valleys, between the mountain ranges, as from Idaho and Washington to Colorado, Utah, and northern Nevada, the characteristic shrub is sagebrush, sometimes mixed with or replaced by rabbit brush.

DESERTS

Although continuous with the sagebrush area of the Great Basin, the so-called deserts of the Southwest, at least in southern Texas, Arizona, and westward, are characterized by a totally different climate and a completely different type of vegetation. There millions of plants appear in flower after the rainy season, and in reality most of the deserts

(*Continued on page 7, column 1*)

BIRDS OF KOREA HAVE MANY COUSINS IN THE CHICAGO AREA

By AUSTIN L. RAND
CURATOR OF BIRDS

The natural history of Korea has been studied chiefly by the Japanese. Many of their findings are inaccessible to Occidental students. Many of the papers may be unavailable, and of those known many are in Japanese, read by few of our students.

Fortunately for us, Korea has an excellent, up-to-date *Check-list of Birds*, published at Harvard in 1948. It is the work of Dr. Oliver Austin, Jr., an outcome of his war service. He served in the Pacific with the Navy, was trained in military government in 1945, and went to Korea to assist in rehabilitation of agriculture there. While there he collected and studied birds. Later in the United States and then in Japan as a civilian official he continued the work that resulted in this authoritative list.

EAGLE OWL OF KOREA

Also found in other parts of Asia and in northern Europe. It resembles quite closely the great horned owl of North America.

RESEMBLE CHICAGO BIRDS

Korea, a peninsula about 600 miles long, with its northern part at about the latitude of New York and with mountains higher than 8,000 feet, has a Holarctic bird fauna. This is another and a much shorter way of saying that the birds of Korea are part of the bird life characteristic of the north-temperate and Arctic areas of North America, Europe, and Asia. Sometimes the same species occur in Chicago and in Korea, sometimes they represent different subspecies, and sometimes they are representative species; but the similarities between many of the birds of Korea and those of the Chicago area are striking. Some comparisons are of interest.

The most recent list of Chicago birds contains 371 forms. The Korea list gives 355. This might be taken to imply that the region about Chicago is richer in birds than the whole of Korea, but that conclusion is hardly justified. In Chicago for many years bird-watchers have been looking for unusual visitors and so they figure prominently in the Chicago list. Similar watching in Korea would increase the list there.

The ducks recorded in Chicago number 40; those in Korea 36. Of these, 17, including such well-known forms as mallard, green-winged teal, shoveler, golden-eye, greater scaup, and both of our larger mergansers, occur in both places.

SHORE SPECIES

On the west coast of Korea, where the tide has a rise and fall of 20 to 36 feet, there are extensive mud flats that sound ideal for shore birds. Here, too, in migration time the Chicago bird-watcher might find many familiar species on migration as on our beaches: golden- and black-bellied plover, turnstone, knots, least and red-backed sandpipers. Along with these familiar birds, of course, would be unfamiliar ones: several species of small plover very like our ringneck semipalmated plover, two curlew with long bills very like our long-billed curlew, godwits, redshanks, greenshanks, and green, wood, and common sandpipers that would be familiar to a European ornithologist. And there occur a few very strange little birds like the spoon-billed sandpiper with a spatulate tip to its bill. The stilt and the avocet that occur are species different from ours, but would be recognized as close relatives.

The hawks comprise another group large in number. In the Chicago area we have 22 recorded; in Korea there are 28. Some kinds occur in both areas but not many; the pigeon and duckhawk, the osprey, golden eagle, marsh hawk, rough-legged hawk, and goshawk. There are some interesting geographical representatives: the little rufous-backed falcon we call a sparrow hawk is represented by the kestrel; the small, short-winged, bird-catching kind we call a sharp-shinned hawk has its place filled in Korea by a similiar species the Europeans call a sparrow hawk. American birds of prey that are scavengers are the turkey vulture and the black vulture belonging to a strictly American family; in the Old World their place is taken by vultures of another family of which the cinereous vulture occurs in Korea.

RICH IN EAGLES

Korea is richer in eagles than the Chicago area, having two sea eagles of the bald-eagle type and three of the golden-eagle type, as well as some other big hawks known as hawk eagles or buzzard eagles.

Some of our common well-known birds we share with Korea: the barn and bank swallow, the black-capped chickadee, and golden-crowned kinglet. We also share some other perching birds, perhaps less known in the Chicago area though they occur: the pine siskin, redpoll, red cross-bill, Lapland longspur, Bohemian waxwing, red-breasted nuthatch, brown creeper, and magpie.

A list makes dry reading, but the above facts will indicate that many birds are shared by Chicago and Korea. Even where the species are different, closely related species often represent each other. This is shown by the following list of owls:

In Chicago Area	*In Korea*
Screech owl	Two scops owls
Horned owl	Eagle owl
Snowy owl	Snowy owl
Hawk owl	Hawk owl
	Brown hawk owl
Burrowing owl	Little owl
Barred owl	Wood owl
	Ural owl
Long-eared owl	Long-eared owl
Short-eared owl	Short-eared owl

Korea has a pronounced seasonal change of bird life, as does the Chicago area, and time after time in the list one sees the remark "winter visitor or straggler" for the snowy owl, red-throated loon, and horned grebe, birds that nest farther north on or near the tundra and migrate south to spend the winter, just as they come to our own latitudes. As in Chicago where many species nest far to the north of us and pass through our area to winter to the south, so it is in Korea. The term "spring and autumn transient" we see as characterizing many of the shore birds and such birds as some of the willow warblers and thrushes.

GREAT HORNED OWL

Found over large areas of United States and Canada. Note resemblance to eagle owl of Korea.

So far I've touched on the many similarities. Brief mention should be made of some of the differences. In Chicago we had the wild turkey (it's now gone from our area) of a group found only in America, the tyrant flycatchers (11 forms), the mockingbird family (mockingbird, catbird, and thrasher),

the vireos (7 species), the woodwarblers (38 species), and blackbirds, etc. (12 species) —all groups that are found only in America.

DISTINCTIVE SPECIES

To offset these, in Korea we find the magnificent Eurasian grouse called the black cock, and there, too, we find the ring-necked pheasant, the ancestral species of the ring-necked pheasants introduced for hunting into our country. The large groups of small insect-eating birds mentioned above as being strictly American have their ecological counterparts in the large group of Old World flycatchers (a quite different family from the tyrant flycatcher) and the Old World warblers, only a few of which occur in America.

The thrush family in Korea is interesting to compare with ours. Our robin is a large thrush, as is the European blackbird, and in Korea there are eight species of this type. In addition, there are several small, lightly built thrushes known as chats and redstarts (nothing to do with our warbler known as a redstart). It is to this latter group of thrushes that the robin redbreast of England belongs, the bird from which our robin got its name. The pipit-wagtail family is also much richer in Korea. There one finds twelve species, while in the Chicago area we have but one, and in all North America only seven forms have been recorded.

There are a number of other striking groups of birds, exlusively Old World, that occur in Korea. The button quail is one, a tiny quail-like bird easily recognized by its having only three toes, rather than four as the quail proper has. The bustard in Korea is a large, running bird of the open country, noted for its elaborate display at mating time. The painted snipe belongs to a special family that is noteworthy for the female being larger and the male incubating the eggs, as in the phaleropes. Babblers, a group of passerine birds very rich as to species in southern Asia, are represented by only a single species in Korea. Bulbuls, so common in Asia and especially tropical Africa, are also represented by only a single species, as are the pittas, cuckoo shrikes (represented by a minivet), Old World orioles, white-eyes, hoopoes, and rollers.

Of birds with whose names we might be familiar from European literature, one finds such things as the wryneck, rook, jackdaw, and sand grouse.

About Chicago's streets the pigeon is common. It was introduced from the Old World. In Korea the parent species, the rock dove or, as Austin calls it, the blue hill pigeon, occurs commonly in a natural state.

The house sparrow of Chicago is also an introduction from the Old World. Although in Korea there are no house sparrows, a close relative and very similar-looking bird, the Eurasian tree sparrow, is the common dooryard bird of Korea.

CRIMSON-SNOW MYSTERY OF TOMATO JUICE CREEK

By EUGENE S. RICHARDSON, Jr.
CURATOR OF INVERTEBRATE FOSSILS

LAST AUGUST my son Ned and I spent several days hunting for an exposure of fossil-bearing Middle Cambrian shale, said to be on Granite Creek in the Gros Ventre Mountains of western Wyoming. When we finally found the exposure, it wasn't on Granite Creek at all, but on one of its small tributaries, which we would never have investigated had it not been for its peculiar behavior. For the collection of Middle Cambrian fossils that we were able to bring back to the Museum, we are indebted to two points about that tributary that we couldn't explain offhand.

In the first place, where the tributary crossed the floor of Granite Creek valley, it had deposited several acres of unsorted gravel and boulders, spread along and between five major channels and numerous smaller ones, and had piled them up around trees that had obviously been free of boulders a year before. High-water mark on the trunks showed that the water had run five feet deep at a distance of several hundred feet from the present meager stream. Where it crosses the trail, this is less than a foot deep and only three feet wide. Clearly, there had been a magnificent spring flood on this stream, though other tributaries close by had had no such experience. We wondered why one stream should have flooded when its neighbors had not.

RED IN THE AFTERNOON

More arresting than the signs of flooding was the color of the water itself. Clear and potable in the mornings, it was always red by afternoon! But on two occasions when the preceding night had been warm, the current was running red in the morning. Temperature, then, had something to do with it. Because the stream had no name and was not even indicated on the large map of the Teton National Forest, we called it Tomato Juice Creek.

One day, having still found no trace of the Middle Cambrian shale in the valley of Granite Creek, we postponed our unproductive search and attempted to follow Tomato Juice Creek to its source. Perhaps we'd find a snowbank that melted in the afternoon sun and flowed across a patch of soft red rock. Perhaps we'd find a spring in some red rock, flowing only when warmed in the sun.

From the Granite Creek trail we could see the groove that was Tomato Juice Creek's valley, stretching up the mountainside until lost at the base of a high cliff of buff limestone, stained red where the stream must fall over it. The steep west-facing slope was shadowed in the morning but received the direct rays of the afternoon sun.

Leaving the open floor of Granite Creek's valley we found that the gorge of Tomato Juice Creek was only wide enough for the water itself, while the banks were too steep and smooth to provide a footing. Accordingly, we waded up the stream, and thus, in the side of the gulch, a mile from Granite Creek, we came upon the long-sought outcrop of Middle Cambrian shale. The small valley was choked here and there with a tangle of broken trees, kept green by the running water—alpine fir, aspen, limber pine, and others—over which we climbed.

At one place we crawled through a snow tunnel 30 feet long. The top of the tunnel, too, was littered with fallen trees.

The answer to the first question was before us. Snow deep enough to remain through the summer and the host of displaced trees indicated a snowslide. The many channels, the boulders, and the high-water marks down below told that the snowslide had held back a small lake and that the snow dam, melting in the spring weather, must have suddenly broken.

CRIMSON WATERFALL AND SNOW

The water at our feet was still red; so we climbed on, over small waterfalls, trees, boulders, and more snow, cutting footholds in the bank to detour around a cliff with a red waterfall. By midday we had reached the base of the big red-stained cliff that we had seen from below. The water trickling over the stained cliff was now clear, and at our feet lay the answer to the second question. The stream was bridged by a succession of snow tunnels, and that snow was red! Cutting into it with our picks, we found the snow as red as the inside of a freshly broken red brick. From it, drops and rivulets of dark-red muddy water were falling into the stream, giving it the color that it carried three miles down the hill to Granite Creek.

Time prevented our going around and above the high cliff to find why the snow itself was red and why the cliff was stained, but the answer seems clear. Coming up from Granite Creek, we had climbed in succession over the outcrops of all the formations deposited during the Paleozoic era, from the Cambrian rocks at the bottom to the Permian limestone forming the cliff before us. Above the Permian, as we had found at another locality several miles away, lies a thick succession of red sandstones and shales deposited during the Triassic period. Apparently, at this one place on the divide between the Crystal Creek drainage on the east and the Granite Creek drainage on the west, the Triassic rocks have not yet been stripped away. Wind accompanying the snow must have swept up a cloud of dust from the exposed red shale. This, trapped in the falling snow, made banks of red snow to melt in the summer sun and entice us to the discovery of the Middle Cambrian shale far downstream.

MUMMIES, SANDALS, SNARES FROM MOGOLLONS' CAVE

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

FOR SEVERAL SEASONS the Southwest Archaeological Expedition of Chicago Natural History Museum has explored various ancient villages near Reserve in Pine Lawn Valley, west-central New Mexico. The villages were composed either of pit houses or surface, multiroomed apartment houses with masonry walls. They ranged in date from about A.D. 300 to A.D. 1000 and were inhabited by the Mogollon Indians, who differed greatly from the Cliff Dwellers.

By Gustaf Dalstrom
Artist, Anthropology

Restoration of Mogollon 'Fashions' in 6th Century A.D.

In addition, the writer, as leader of the expedition, and Dr. John B. Rinaldo, principal assistant, have discovered the camp sites of Indians who knew no pottery and practiced no agriculture and who eked out an existence by gathering nuts, roots, and berries. These people, known now as the Cochise Indians, lived in Pine Lawn Valley about 4,000 to 5,000 years ago.

But we were up against a most difficult situation. All the materials recovered up to 1950 consisted of tools of stone and bone and smashed bits of pottery.

How could we completely visualize the daily life of these people from such meager data? How could we find out about their dress, their skill as craftsmen?

CAVE HOLDS ANSWERS

The answer: "By digging in a bone-dry cave."

If such a cave could be located and if neither rain nor snow had ever dampened the dust, rubbish, and prehistoric "junk," then we could state, not guess, how the Mogollon Indians wore their hair, how they dressed, how they took care of their babies, what crops they grew—in short, how they lived from day to day.

These facts, in and of themselves, are interesting but not too significant. The importance of such knowledge lies in what it contributes to our history of mankind, what it can tell us about the ways in which men settled specific problems in the past, and what gaps it can help to fill in formal history, which deals mostly with kings and queens, battles, and empires. But what contributions to our knowledge can the history of these preliterate Mogollon Indians make? Who discovered agriculture and when and where in the New World? What contributions will our cave-facts make to the science of botany? What trade took place? In other words, what can we learn from the past?

THE 1950 DIG

Before answering these queries in part, let us pass to the expedition's actual dig of 1950.

We found a dry cave—bone-dry—the deposits of which had never been injured by rain or snow, for dampness would rot all the materials we most wanted. The cave, about 150 feet above the Tularosa River and about 25 miles from camp, was located only after several years of arduous search.

When we first saw it we wondered if this cave, which we dubbed Tularosa Cave, would give us the materials we so eagerly sought. Would it help answer some of our questions? It was a gamble—a big gamble—but it paid off. We "hit the jackpot."

The dry materials, sandals, snares, bows and arrows, corn, and other objects poured into our laps, as it were, faster than three of us could catalogue them. About 3,500 specimens were uncovered all told.

But first, what about the digging?

It was slow, dusty, and disagreeable. We came home at night looking like coal-miners and eager for a shower. Special respirators and goggles had to be worn; otherwise no human being could have stood the fine dust, which was so thick that one could not see his hand before him. Artificial lights had to be used. The digging was uncomfortable but the results were magnificent.

At this writing, when most of the materials await careful analysis, we cannot announce final details. But we can enumerate some of the more spectacular finds.

200 SANDALS UNEARTHED

In a terrain such as that near Tularosa Cave, where sharp volcanic rocks protrude, where there are many thorns and much gravel, protection of the feet was of paramount importance. In their search for game and wild foods, in their long tramps to trade or visit distant shrines, the people had to have footgear. And the answer to this lay in sandals. And sandals they made, for we found about 200 of them—some in good shape and some worn out. Since skins and hence leather were scarce, wild fibers were utilized, mostly yucca fibers.

To obtain meat, ingenious methods were resorted to. Of course, some game was killed by means of the spear-thrower in early times and by bows and arrows in later times. But much game was captured by means of snares, big ones and little ones. In one cache we found eleven large snares, made of braided rope, each one about six feet long. At one end were ties for fastening the snare to a stake or a tree; at the other end was a large noose, made with a slip-knot. A large noose such as this would easily snare a wild pig, a mountain sheep, or a deer.

And speaking of snares and knots, we found that these early people knew all the knots that we know, such as square knots, grannies, slip, half-hitch, and sheet-bend.

In addition to these, we found digging-sticks for planting corn, rush mats, cradles, whistles or flutes, beads, fragments of cloth (some of which had colored designs), fur and feather blankets, string aprons, ornaments, bags, tobacco pipes, cigarettes, "martini" sticks with juniper berries impaled like olives, wooden spoons (just like those sold in the 10-cent stores today), hair nets, baskets, cloth bags, religious fetishes, and a doctor's bag containing herbs and "tools." But no hats of any kind.

FASHIONS CHANGED

One thing that interested us was the discovery that styles changed among the prehistoric Mogollon Indians just as they do today. So Paris or no Paris, styles come and go.

What sorts of vegetable foods did these Indians cultivate and eat?

The No. 1 item was corn. Now we have found a very early, primitive type of corn called pod corn, which may date at 400 B.C. or several centuries earlier. Corn is supposed to have originated in South America, but our corn may rank among the earliest and most primitive. Popcorn was also grown, and it was popped on the ear! Our corn may not settle the question as to the place in which corn originated, but it may greatly help botanists trace the history and development of this important cereal.

At about the same time that corn became known to these Indians, beans, squash, pumpkins, and gourds were also planted and cultivated. In addition to these cultivated plants, we found that the Mogollon Indians also ate walnuts, piñon nuts, grass seeds, sago-lily bulbs, and yucca and cactus fruits. So, with some meat, these people fared very well.

MUMMIES FOUND

But the big finds of the season were two mummies. These are the first to be surely identified with the Mogollon culture and may date at about A.D. 600 or earlier. The hair on these fellows had been trimmed in a "GI" haircut style. One mummy wore a string apron and was wrapped in a fur robe. Each body had been laid on a soft bed of grass and carried to the grave on a large rush mat. A deerskin robe was placed over the body, then more soft grass, and then dirt.

Complete stratification, like a layer cake, of all periods of Mogollon history from perhaps 2500 B.C. to A.D. 1300 was laid bare

in the cave. Here were buried the treasures and castoff pieces of a civilization that flourished before Rome was great and which came to an end at about the time our ancestors in Europe were setting forth on the Crusades. It was like cutting a great section out of history and looking at it layer by layer, page by page—just as it was laid down—the earliest, first or deepest in the cave, and the latest, on top of the deposits.

PHOTO CONTEST OPENS

The Nature Camera Club of Chicago and Chicago Natural History Museum will present the sixth Chicago International Exhibition of Nature Photography at the Museum during February. All persons interested in nature photography—both amateur and professional photographers—are invited to send their best nature pictures for entry in this contest. Deadline for entries is January 15. The judges will be: Conrad Emanuelson, photographer; John W. Moyer, Chief of the Museum's Division of Motion Pictures, and Dr. Rainer Zangerl, Curator of Fossil Reptiles; R. Marlin Perkins, Director of Lincoln Park Zoo; and Merrill Tilden, photographer.

The exhibition will be composed of two divisions, prints and transparencies. No more than four entries may be submitted in either division. There are three classifications in each division. They are: *Animal Life*—animals, birds, insects, tracks, nests, etc. (no domestic animals); *Plant Life*—flowers (except formal arrangements), trees, shrubs, fungi, etc.; *General*—scenery, geology, clouds, etc. (not included above). Prints (except from foreign contributors) must be mounted on 16″ x 20″ mounts. Color slides or transparencies should not exceed 3¼″ x 4″.

Silver medals and ribbons will be awarded in the various print and slide classifications. Entry forms and a complete resume of conditions of the contest may be obtained from the Museum. Entries should be sent to the Museum.

The exhibition will be held in Stanley Field Hall of the Museum, February 1 to 28, inclusive. There will be two special Sunday projections of color slides at 3 P.M. on February 11 and 18.

U.S. LANDSCAPES—

(*Continued from page 3*)

harbor a rich plant-life. Three types of these subtropical deserts can conveniently be recognized: the California desert, marked by the creosote bush; the succulent desert, chiefly of Arizona and California, characterized by the abundance of cacti; and the thorn or small-tree desert, of California, Nevada, and Utah. The real appeal of the desert itself cannot be doubted, regardless of how it is divided according to the plants growing in the different areas. Whether the traveler is visiting the desert in northern Arizona, at the edge of that vast eroded area of a thousand tints, appropriately named the Painted Desert, or crossing a zone of the bizarre Joshua trees scattered sentinel-like down the long slopes of southwestern Nevada, or in a seemingly endless tract of mesquite and acacia, covering much of Arizona, California, and other areas, or feeling lost in the fantastic atmosphere created by a forest of the great columnar cacti, the sahuaro, his sense of beauty will be quickened, his interest aroused.

Here we may fittingly conclude our travelogue devoted to some of the more striking formations of plants, especially of forests, seen in various parts of the country. It is scarcely necessary to remark that the picture presented is fleeting and impressionistic.

STAFF NOTES

Byran Patterson, Curator of Fossil Mammals, is at the University of California, presenting a series of lectures on fossil mammals and related subjects .... **Dr. Paul S. Martin,** Chief Curator of Anthropology, recently conducted a seminar in archaeology at the University of Arizona. **Dr. John B. Rinaldo,** Assistant in Archaeology, and Dr. Martin attended an archaeological conference at Flagstaff, Arizona. With **John W. Moyer,** Chief of the Division of Motion Pictures, Dr. Martin showed the Museum film "Archaeologists in Action" in Reserve, New Mexico, where it was of particular interest to the people of the community because it was "shot" right in their vicinity .... **Miss Elaine Bluhm,** of the Department of Anthropology, spent two months as cartographer for an expedition of the University of Utah. During the summer she also assisted Dr. Martin's Archaeological Expedition to the Southwest, cataloguing the material recovered from the excavation of Tularosa Cave.

Technical Publications Issued

The following technical publications were issued by Chicago Natural History Museum during the last month:

Fieldiana, Geology, Vol. 10, No. 9. *The Temporal Region of the Permian Reptile Diadectes.* By Everett Claire Olson. September 29, 1950. 16 pages, 6 text figures. $0.20.

Fieldiana, Geology, Vol. 10, No. 10. *A Middle Devonian Octactinellid Sponge from New York.* By Eugene S. Richardson, Jr. October 5, 1950. 10 pages, 5 text figures. $0.25.

Man is certainly stark mad; he cannot make a worm, and yet he will be making gods by the dozens. —*Montaigne*

SUNDAY LAYMAN LECTURES BEGIN THIS MONTH

The new series of programs on Sunday afternoons by Paul G. Dallwig, The Layman Lecturer, begins in November with the presentation each Sunday of the month (November 5, 12, 19, and 26) of a new subject just added to his repertoire, "Life —What Is It?" This marks the return of Mr. Dallwig to the Museum after an absence of several years. In his current lecture he will discuss such questions as the following: How did life start? Where did it start? Was it placed on this earth by divine power? By cosmic rays? By a combination of chemical substances? Is it electricity? The latter part of this lecture will be illustrated with the Museum's exhibit on human birth (Hall 19).

The lecture will begin at 2 P.M. and end at 4:30 P.M. Midway there will be an intermission for tea and other refreshments in the Museum Cafeteria. Mr. Dallwig will repeat the same subject on each of the Sundays during November. In December his subject will be "The Caveman Knew His Way Around"; in January, "Living Races and Their Way of Life"; in March, "Behind the Scenes in Our Museums"; and in April, "The Romantic Story of the Diamond." During February Mr. Dallwig will be on a lecture tour and therefore will not appear at the Museum.

Members of the Museum may use their membership cards to attend these lectures without advance reservations. All others, except out-of-town visitors and representatives of the press, must make advance reservations to attend the Sunday lectures. Reservations may be made by mail or telephone (WAbash 2-9410). The lectures are free.

Norfolk Island Pine Added To Hall of Foreign Woods

Norfolk Island pine with its well-spaced whorls of horizontal branches is a favorite house plant and extensively cultivated outdoors, as in California and Florida. Not directly related to the pines of the northern hemisphere, Norfolk Island pine (*Araucaria excelsa*) belongs to the family Araucariaceae, found in South America, Australia, various islands in the South Pacific, and the Philippines. Named after tiny Norfolk Island located between New Caledonia and New Zealand, the only place where it grows wild, this tree attains a height of 200 feet and a trunk of 10 feet in diameter. The cones of this species are large, woody globes measuring 5 inches across. Its strong and durable wood is much used in shipbuilding.

The large board exhibited in Hall 27 (Hall of Foreign Woods) is a gift of O. A. Oaks, of Wilmette, Illinois, an ardent wood collector, who has previously given the Museum other valuable foreign woods. The specimen was prepared for exhibition by Preparator Mathias Dones.

4 MORE ADULT LECTURES, SATURDAYS AT 2:30

On Saturday afternoons throughout November the Museum will continue its annual Autumn Course of free illustrated lectures on travel and science. The lectures will be given in the James Simpson Theatre of the Museum and all will begin at 2:30 P.M. The lectures will be illustrated with motion pictures in color.

Limited accommodations make it necessary to restrict these lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lecturers:

November 4—COLUMBIA RIVER COUNTRY

Biography of a mighty river from source to sea

Francis R. Line

November 11—YUCATAN

Ancient ruins and modern life in Mayaland

Roy A. Whipple

November 18—OUR FABULOUS GREAT LAKES

A pictorial study in economic geography

Clifford J. Kamen

November 25—DUTCH GUIANA PORTRAIT

Peoples of a colonial jungle outpost

Robert Leighton

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:25 o'clock on the lecture day.

NOVEMBER LECTURE TOURS, DAILY EXCEPT SUNDAY

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Nov. 1—Man and Metals (*Anne Stromquist*).

Fri., Nov. 3—Primitive Music and Musicians. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Nov. 8—Winter Change-over—Adjustments People and Animals Make to Winter Environment (*Harriet Smith*).

Fri., Nov. 10—The Dynamic Earth. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Wed., Nov. 15—Eskimo Life (*June Buchwald*).

Fri., Nov. 17—Feast Days and Fast Days. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., Nov. 22—Giants—Large Plants and Animals (*Marie Svoboda*).

Fri., Nov. 24—Activities of a Great Museum. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Nov. 29—Chicago's Winter Birds (*Jane Sharpe*).

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received recently:

Department of Botany:

From: Illinois State Museum, Springfield, Ill.—20 herbarium specimens, Illinois.

Department of Geology:

From: O. R. Wray, Moranda, Quebec—a specimen of *Dalmatianite*, Canada; M. L. Darling, Detroit—a specimen of native copper, Michigan; Karl P. Schmidt, Homewood, Ill.—a specimen of Loess concretion, central Germany; Joseph Hutchinson, Morenci, Ariz.—11 pieces of agate, Arizona; Joaquin Gutierrez, Consul of Colombia, Chicago—139 mineral specimens, Colombia.

Department of Zoology:

From: Maj. Robert Traub, Washington, D.C.—10 paratypes of fleas on slides (El Salvador, Mexico, and Malaya) and 29 fleas representing 10 species on 18 slides (worldwide); Chicago Zoological Society, Brookfield, Ill.—a baby gorilla, a two-toed sloth, and a penguin egg; William J. Gerhard, Chicago—1,600 beetles, pinned and labeled, United States; Col. E. N. Wentworth, Chicago—a razorback hog skull; J. E. Johnson, Waco, Tex.—22 snakes, Texas; D. C. Lowrie, Moran, Wyo.—3 snakes, Wyoming; Richard zur Strassen, Frankfurt, Germany—a paratype of a parasitic wasp, Germany; Mauro Cardenas Figueroa, Mexico City—3 lizards, Mexico; Lincoln Park Zoo, Chicago—a golden cat; Karl Ludwig Koch, Frankfurt am Main, Germany—a bird skin, Germany; Dr. Sherman A. Minton, Jr., Indianapolis, Ind.—9 salamanders, Indiana; Dr. Henry van der Schalie, Ann Arbor, Mich.—31 lots of freshwater clams, United States; David Berstrom, Albuquerque, N.M.—81 specimens of land and freshwater shells, Tennessee; Gordon Thurow, Chicago—7 salamanders, Indiana; Heinz Felton, Frankfurt, Germany—9 mammals, Germany; Laura Brodie, Chicago—89 miscellaneous freshwater fishes, South Carolina; Dr. Carl Hubbs, Austin, Tex.—95 fishes, including 55 paratypes, tropical western Pacific.

Library:

From: Rush Medical College, Chicago.

CHILDREN'S MOVIE SERIES ON SATURDAY MORNINGS

The Autumn Series of free motion pictures for children on Saturday mornings will continue weekly through November 25. Four more programs are to be presented under the auspices of the James Nelson and Anna Louise Raymond Foundation in the James Simpson Theatre of the Museum. All of the programs start at 10:30 A.M.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are needed.

Following is an outline of the programs:

November 4—INDIA

A story of life on a farm and on a tea plantation

Also a cartoon

November 11—NATURE'S KALEIDOSCOPE

John Kieran's stories of actual happenings in nature, "stranger than fiction"

November 18—JAPAN

How Japanese city and farm families live

Also a cartoon

November 25—THE CIRCUS

The whole circus story from the unloading of the tent and animals to the big-top show

Also a cartoon

NEW MEMBERS

The following persons became Museum Members between September 18 and October 13:

Sustaining Members

Carl G. Bingham

Annual Members

David H. Barnow, H. L. Baumgardner, George R. Beach, Jr., D. R. Beaumont, Miss Loraine Blecha, John B. Brenza, Adelbert Brown, Baird Brown, A. T. Burch, Guy S. Burtis, Harold William Burtness, Chester L. Butler, John C. Butler, M. E. Chinn, Henry L. Cox, Miss Lulu S. Elmer, Mrs. J. M. Fallis, William M. Hammond, Dr. George R. Hazel, Miss Ruth Kilbourn, Boyd Knell, Robert Leighton, Miss Hallie Magill, Robert McDougal, Jr., William L. McLennan, Miss Marguerite Painter, Gerald Presson, Robert H. Ruhl, George Ruhnke, Dr. Jakub G. Schlichter, Chester Skoner, Frederick W. Walker, Jr., Gustave J. Willy, Lawrence A. Woolf.

Audubon Lectures to Begin

The Illinois Audubon Society will present the first of five lectures on Monday evening, November 27, at 8 o'clock, in the James Simpson Theatre of the Museum. Carl W. Buchheister, Vice-President of the National Audubon Society, will speak on "Wild Life Down East," illustrated with color motion-pictures. The theatre will be open at 7:30 P.M.

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Chicago Natural History Museum

Chicago Natural History Museum

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Members are requested to Inform the Museum promptly of changes of address.

A MONUMENT OF RESEARCH

BY EMMET R. BLAKE

ASSOCIATE CURATOR OF BIRDS

Some of the most important, if little-publicized, programs of research conducted by museums are completed only after years of methodical application by one or more staff specialists. Such is the case with the *Catalogue of Birds of the Americas and Adjacent Islands*, a monumental (6,372-page) technical treatise of which the fifteenth and final volume was published by Chicago Natural History Museum in August, 1949, or 31 years after the appearance of the first volume.

Catalogue of Birds of the Americas, or the *Catalogue*, as it is generally known, treats all of the species (4,227) and subspecies (8,896) known to occur in North America, Mexico, Central America, the West Indies, the Galapagos Archipelago, and other islands with related faunas. In addition to the vernacular and scientific name of each, there is a reference to the original description, to colored plates, and to various standard works and revisions. A statement of range is also given, followed by a list of specimens in Chicago Natural History Museum. Diagnostic descriptions of birds not included in the standard British Museum *Catalogue of Birds* and Ridgway's *Birds of Middle and North America* are presented in footnotes, where also are found taxonomic comment, the whole constituting one of the great pieces of bibliographic and ornithological research of the world.

A work of such scope is of inestimable value to the research ornithologist, and it is primarily for the research ornithologist that the *Catalogue* was written. Although less directly useful to the casual student, those who translate technical ornithology into media more palatable to the layman will find between its covers a staggering compilation of references to scattered sources of authentic information that might otherwise be sought in vain.

INVALUABLE IN RESEARCH

The considered opinions of various qualified reviewers are perhaps best summarized by the words of one who stated that the *Catalogue* is "an indispensable tool of the ornithologist that will take its place alongside such standard classics as the British Museum's *Catalogue of Birds*, Ridgway's *Birds of Middle and North America*, and Peter's *Check-list of Birds of the World*." One of the most important publications ever issued by the Museum, the *Catalogue* is perhaps also the greatest and most lasting scientific monument to each of its authors.

To Charles B. Cory, former Curator of Zoology, and to the late Wilfred H. Osgood credit is due for the inception of the imaginative program that was to result years later in the publication of the monumental *Catalogue*. In 1909 Cory and Osgood, the latter at that time Assistant Curator of Mammals and Birds, formulated plans for an intensive study of the South American fauna, a program that has been followed more or less continuously to the present day.

As might be expected, considerable emphasis was placed on birds from the very beginning. With expeditions almost continuously in the field, Cory devoted much of his time to bibliographic and taxonomic matters in preparation for his projected *Catalogue of Birds of the Americas*. The first part was published in 1918, the second in 1919. At the time of Cory's death in July, 1921, Part 3 was ready for the printer and the manuscript of the fourth part was nearing completion.

HELLMAYR AN AUTHORITY

The early parts of the *Catalogue* were so well received that its completion was almost obligatory. Dr. Charles E. Hellmayr of Vienna, one of the greatest authorities on tropical American birds, was chosen to complete the task and joined the Museum staff in October, 1922, with the title of Associate Curator of Birds. After a number of volumes had been published Dr. Hellmayr returned to Vienna in 1931 and pursued his studies in various European museums.

Dr. Hellmayr's death in Switzerland in 1944 found the *Catalogue* nearing completion, but manuscripts for the final four books were still unpublished and in need of final revision. This considerable task was undertaken and ably accomplished by the late Boardman Conover, a Trustee and Research Associate of the Museum, whose death last May followed by less than a year the publication of the final volume.

For many years to come anyone studying American birds—whether writing a life history of a single species or working out the systematics of a group or of a single subspecies, whether preparing a state list, working on a zoogeographical problem, or elucidating the phylogeny and relationships of a group, whether checking a date or a reference or a description—can refer to this monumental publication and undoubtedly find something of help, if not the exact data needed.

THIS MONTH'S COVER

Our cover picture shows a winter camp of Indians of the Lake Michigan region about the year 1650. The Indian families left their summer villages and established separate family hunting camps. The winter dwelling was usually dome-shaped and made of saplings covered with animal skins, bark, or woven mats. The women took care of the children and kept house while the men and older boys hunted.

The return of the successful hunter was a joyful occasion, and for an Indian child might have been as festive as is Christmas to a Christian child. Santa's reindeer would have provided food and clothing for a number of Indians.

Thus our cover picture is the Museum's "Christmas card" to its Members, to all of whom are extended the season's best wishes.

The photograph shows a miniature diorama, one of a series in preparation for a Hall of the Indians of Prairies and Woodlands scheduled to be opened next spring.

An article on Christmas plants by Dr. Julian A. Steyermark of the Department of Botany appears on page 5.

Education in Nature

Education is the instruction of the intellect in the laws of Nature, under which name I include not merely things and their forces, but men and their ways; and the fashioning of the affections and of the will into an earnest and loving desire to move in harmony with those laws.

THOMAS H. HUXLEY, in "A Liberal Education; and Where To Find It"

EXPLORERS COME BACK FROM 'ANOTHER WORLD' IN BORNEO

By D. DWIGHT DAVIS
CURATOR OF VERTEBRATE ANATOMY

The members of the Borneo Zoological Expedition returned to Chicago recently, after nearly five months of field study and collecting in North Borneo. The writer, accompanied by Robert F. Inger, Assistant Curator of Fishes, traveled by air around the world, stopping along the way at Manila, Singapore, Kuching, Paris, and London to study collections in natural history museums. Headquarters were established at Sandakan, North Borneo. The collections made by the expedition were shipped by boat and have not yet arrived in Chicago.

IN THE BORNEO RAIN FOREST

Gigantic trees form a dense green canopy. The tree shown is a kayu rajah, the "king of the forest." The rain forest is perpetually gloomy, damp, and windless.

Borneo, the third largest island in the world, lies squarely on the equator, almost exactly halfway around the world from Chicago. It has a constantly damp tropical climate, with more than 130 inches of rain a year, compared with about 30 inches for Chicago. There are no wet and dry seasons in Borneo as there are in many other parts of the tropics; the seasons are only wet and slightly less wet.

The island was originally covered with dense tropical rain forest, which remains green the year around in the absence of a dry season. Much of this forest has been destroyed by the natives, who have cut down and burned over huge tracts in connection with their primitive agriculture. In northeastern Borneo, where the Museum's expedition operated, the natives are hunters and fishermen and here the forest is intact over thousands of square miles. The immensity of the forest is best appreciated from an airplane. Hour upon hour the plane flies over uninterrupted forest, the endless carpet of trees broken only by occasional glimpses of rivers.

'WHITE SHREW'

This native of Borneo, Sumatra, and the Malay Peninsula is one of the most primitive of living mammals. In spite of its ratlike appearance it is related to the hedgehog of Europe.

PERPETUAL HUMIDITY PLUS!

This eternally green forest is one of the most remarkable habitats in the world. The trunks of gigantic trees, often six to eight feet in diameter and branchless for 80 feet or more, are the skeleton of the forest. The crowns of these mighty trees form a continuous green canopy, the dense roof of the forest. Beneath the trees it is perpetually humid and windless, only dimly lighted even on the brightest days. There is almost no variation from day to day, and little even between day and night. Botanical writers have compared the forest to a gigantic hothouse.

It is not surprising that some of the most interesting animals on earth should live in the damp windless world enclosed by this forest, many of them spending their lives in the trees. To learn something of the habits and behavior of these creatures was the main objective of the Borneo Zoological Expedition. Studies centered primarily on mammals, frogs and toads, and fishes, but other animals were collected.

LIKE ANOTHER PLANET'S LIFE

It is almost impossible to convey in words an adequate idea of what a tropical rain forest is like. Description depends ultimately on comparisons with things that are already known to the reader, and there is too much in the rain forest that has no counterpart in the experience of one who has never seen it. It is almost like trying to imagine what life on another planet might be like.

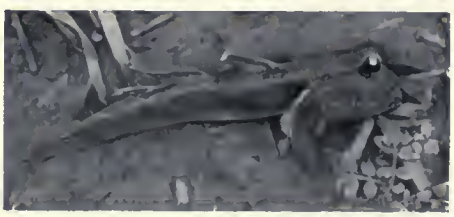
How can one describe the indescribable sensation of watching several dozen bloodthirsty land leeches converging on you from all directions, their grotesque blind gropings bringing them relentlessly nearer and nearer, their sightless probings following your every movement? How meaningful to one who has not seen them is the statement that many of the huge trees sprout in the tops of other trees, which they gradually engulf in a strangling woody clutch until the corpse of the original tree slowly rots away? Who can visualize, from words alone, frog nests hanging, birdlike, high in the trees?

A stupid-looking mammal, blinking in the beam of a flashlight during a nocturnal hike, is the descendant, almost unchanged, of the very first mammals on earth, more than 50 million years ago. No word picture can do justice to this creature out of the past, once progressive and modern compared with his fellows but now a by-passed relic.

'HEAD-HUNTERS' FRIENDLY SOULS

Almost as important are the things about the tropical forest that are not true. Many

(*Continued on page 11, column 1*)



MUD SKIPPER

A fish that spends most of its time out of water. It is of interest to biologists because, like certain prehistoric fishes that gave rise to amphibians, it has solved the problem of coming out of the water and moving about on land.

HEAD-HUNTERS IN FIGHT AGAINST TERRORISTS

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

Perhaps the word "Dyak" would not arrest the attention of the general reader, but the name at once catches the eye of an anthropologist. Recently a Chicago daily newspaper, whose correspondent has been covering the news in Indonesia, mentioned the Dyak jungle dwellers who have been introduced into that region from the island of Borneo.

The Dyaks have been brought to Indonesia with earnest business in view. Their well-known prowess as forest guides and, formerly, as head-hunters earned for them a new appointment. They feel quite at home searching the forests of Indonesia for bands of thugs and political terrorists. These fly-by-night bandits excel in creeping up on peaceful homes under cover of darkness, and many murders have been committed. The Dyaks are good at this kind of midnight prowling, and no doubt enter into the pursuit with real zest. When they make a capture, the Dyaks are not likely to err on the side of leniency. It is a case of like against like—stealth is matched against cunning.

WHO ARE THE DYAKS?

As usual the anthropological facts are complicated and not easy to disentangle. It is enough to say that the Dyaks come from Borneo and may have some Hindu and Javanese blood. There may be a dash of Chinese in some of them, since the Chinese have traded in Borneo for centuries. Dyaks are classed as Land Dyaks and Sea Dyaks and differ somewhat in physical appearance. But the general verdict is that Dyaks have a Mongoloid look.

The black hair is long and straight, plentiful on the head but sparse on the face. Cheek bones are prominent and faces are broad. The eyes are black and slightly slanting. Skin color varies from light brown to dark brown, with a yellowish tinge in certain lights. The teeth are stained from chewing betel nuts. The stature is medium to short, never tall. The build is pleasing and athletic.

HEAD-HUNTING WITH A SMILE

Many of the Dyaks, though inveterate head-hunters, are of a bright and cheerful disposition. Those who know them report that they are sociable and talkative. The Land Dyaks have a separate house for human heads, and this dwelling is the dormitory for all young bachelors of the village. Dr. Charles Hose, my personal friend, spent a lifetime in Borneo and knew the Dyaks well. He says that the Land Dyaks do not tattoo their faces or bodies, but that, on the contrary, the Sea Dyaks (sometimes called Iban) are elaborately tattooed.

Of head-hunting, Dr. Hose said that the Ibans have a terribly morbid desire to take heads. If unsuccessful in other ways, a war party will rob the tombs in villages of other tribes. After smoking the stolen heads these trophies are taken home in triumph, and the returning warriors boast that they had a terrific fight. They seem ashamed to come home without some evidence of success.

As the facts accumulate, the reader begins to understand that the young Dyaks are not necessarily bloodthirsty and sadistic. There must be some obscure motive, a hidden urge. What can it be? Here it is! Women incite the men to be successful warriors and head-hunters. What is more, a girl will taunt a suitor who returns without the head that is supposed to be a guarantee of his courage and skill.

The women seem to have quite a way of their own in handling the men. When a man is married he goes to live with his wife's people for several years, a circumstance that should have a taming influence. The young male Dyak is supposed to have a dual personality: he is expected to be skilled in warfare and head-hunting and yet be amenable to feminine discipline. The custom of the newly wed husband joining the wife's household is common enough. Anthropologists use such words as "matrilocal" and "matriarchal" to describe the practice.

DYAK HEAD-HUNTER
Life-size figure in Malaysian exhibit (Hall G).

The Museum's exhibit of articles made by the Dyaks (Cases 45 and 47 in Hall G) indicates considerable craftsmanship among the Dyaks. There are blowguns and darts for these, spears with well-made iron points, shields of rattan, and war caps. Only men who have taken heads may wear war caps, which are decorated with feathers of the Argus pheasant and the hornbill, a sacred bird.

The Dyaks, in common with most primitive people, believe in ghosts and spirits, and the grotesque masks used in connection with magico-religious ceremonies are shown. There is a musical instrument well designed on the organ-pipe principle—several tubes of different lengths are bound together, and each pipe has a note that is the result of the length of the air column. Bark cloth neatly made into clothes for children and examples of weaving and dyeing are displayed. Brass work is represented by cleverly made receptacles for the lime used with betel-nut chewing.

Evidently when not engaged in less reputable pursuits the Dyak is a competent artisan. The white man sternly repressed head-hunting in Borneo but now gives the Dyak the nod to go ahead and indulge his whim in Indonesia. Considering the stealthy murders that have been committed by Indonesian outlaws, one cannot help wishing the Dyaks good luck as they are sent in pursuit of the brigands.

NATURE PHOTO EXHIBIT DEADLINE NEAR

The attention of all who are interested in nature photography, whether as amateurs or professionals, is called to the fact that January 15 is the deadline for entries for the Sixth Chicago International Exhibition of Nature Photography. This exhibit will be held at the Museum February 1 to 28 under the auspices of the Nature Camera Club of Chicago and the Museum.

Silver medals and ribbons will be awarded in the various print and slide classifications. Entry forms and a complete resume of conditions of the contest may be obtained from the Museum.

The exhibition will be composed of two divisions, prints and transparencies. No more than four entries may be submitted in either division. There are three classifications in each division. They are: *Animal Life*—animals, birds, insects, tracks, nests, etc. (no domestic animals); *Plant Life*—flowers (except formal arrangements), trees, shrubs, fungi, etc.; *General*—scenery, geology, clouds, etc. (not included above). Prints (except from foreign contributors) must be mounted on 16″ x 20″ mounts. Color slides or transparencies should not exceed 3¼″ x 4″.

The judges will be: Conrad Emanuelson, photographer; John W. Moyer, Chief of the Museum's Division of Motion Pictures; Dr. Rainer Zangerl, the Museum's Curator of Fossil Reptiles; R. Marlin Perkins, Director of Lincoln Park Zoo; and Merrill Tilden, photographer.

EVERGREEN CHRISTMAS: SOME LEGENDS OF HOLIDAY PLANTS

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

WHETHER it be in connection with the development of various new commodities for the market, such as television, automobiles, washing machines, or electric refrigerators, North American industry characteristically exhibits a tendency for all-out mass production. The same tendency appears to be prevalent with respect to celebration of Christmas in the United States. Although this country, owing to its shorter human history, has not celebrated Christmas nearly as long as have the European countries, nevertheless it has outstripped all the rest of the world not only in the intensity but also in the commercialization attached to this festive time. Truly, Christmas in the United States has become big business.

COLORADO BLUE SPRUCE

Picea pungens, native to the Rockies and often used as a Christmas tree. It is not as commonly used as the Douglas fir (Pseudotsuga taxifolia) or the Norway spruce (Picea Abies). Photograph reproduced by courtesy of the United States Forestry Service.

Origin of the Christmas-Tree Custom

While toys, gifts of all kinds, and greeting cards comprise one element of this holiday expression and receive a great share of attention, the plants commonly associated with Christmas constitute another but equally important phase of the season. The green-and-red color combination is so truly symbolic of Christmas that the one always suggests the other.

Strange as it may seem, the origin of the Christmas-tree ceremony is still shrouded in uncertainty. No one seems sure of just where or when the custom started. Yet most people in the United States go about buying trees and decorating them for the holidays as if this were originally an American custom. It has been estimated that 100,000 acres in this country are used solely for growing Christmas trees and that seven out of ten occupied dwellings, or some 28 million homes, will be adorned by Christmas trees this year. Where did this custom originate and how?

From the legendary side, it has been pointed out that St. Boniface, English missionary to Germany in the 8th century, approached an oak that had long been the object of pagan worship. After several strokes of his ax, the tree crashed to the earth, but, to the surprise of the onlookers, no harm came to him as he called their attention to a small fir by his feet. This fir, he indicated to them, was to be held as their holy tree. He claimed for it the wood of peace, since their homes were built of it. He said, "It is the sign of an endless life, for its leaves are ever green. See how it points upward to Heaven? Let this be called the tree of the Christ Child—gather about it, not in the wild woods but in your own homes. There it will shelter no deeds of blood [human and animal sacrifices to pagan deities], but loving gifts and rites of kindness."

Symbol of Hope and Love

The Vikings have their legend that "the Lord, in the 9th century, dispatched his emissaries, Faith, Hope, and Charity, earthward to select the first Christmas tree. Tradition has it that they chose the balsam fir because it bore many crosses on every twig and branch, was high as hope and as wide as love."

Among the French and Germans, folklore credits Bonchevalier with the discovery of the first Christmas tree. "Walking through the forest one Christmas Eve, he beheld a tall evergreen, brilliantly aglow with shimmering candlelight and crowned with an iridescent halo. His mother later interpreted this phenomenon by stating that Bonchevalier had seen the 'Tree of Humanity' and that the candles represented the people all over the world, while the halo at the tree's crest was the Christ Child watching over all."

A similar story is told about Martin Luther—that he became enchanted on Christmas night in 1550 by the sparkling of the stars and the glistening reflection of the moonbeams on snow-flecked evergreens. This led him to cut down a small tree, take it home with him, and place it on a table. To the delight of his small children, he decorated the tree with many small lighted candles to simulate the beautiful sights he had seen earlier that evening in the forest.

The Scandinavians are thought by some investigators to have originated the Christmas tree on the basis of their early Christmas practice of erecting poles for supporting sheaves of grain as a Christmas gift for the birds. Still others claim that the first Christmas trees were fruit trees, which were potted months ahead of time and brought into the house to be in full bloom for Christmas. It is recorded that an Arab geographer of the 10th century noted that trees and flowers await bloom on Christmas. According to a French epic, candles were first seen on a flowering Christmas tree in the 13th century, while another legend credits the rod of Joseph of Arimathea with flowering at Christmas at Glastonbury and elsewhere in England. This last legend is built around a hawthorn tree (Crataegus sp.) that is supposed to have blossomed at this time. Today our Christmas trees blossom out with lights and shining ornaments.

Pagan Festivals

Many do not accept the above stories as symbolizing the celebration of the birth of the Christ Child, for they argue that similar customs were in existence more than 5,000 years before the birth of Christ. They point, for example, to the widely practiced

custom throughout the ancient world of decorating houses with green boughs—a custom thought to have originated from the worship of trees by the early peoples. There was likewise the custom then of having sacrificial offerings, in the form of first-

AMERICAN HOLLY

Ilex opaca, a native tree of the United States often used in Christmas wreaths. The European holly (Ilex Aquifolium) is the holly of legend and is cultivated in the northwestern section of the United States.

harvested crops, hung on certain trees in which, it was believed, dwelt spirits or gods. These ancient pagan peoples also worshipped the sun and held big festivals to honor the sun gods at the time of the winter solstice, the shortest day of the year. This festival was called Yule by the Goths and Saxons.

During this same period the early Egyptians hung sprays from palm trees throughout their homes, and Germanic tribes celebrated by bedecking fir trees. Boughs of evergreen and laurel were raised aloft by the Romans during their feasts to Saturn, while the evergreen fir was revered by the Greeks and the Scandinavians at their winter rites. The mistletoe and green boughs in Druid lore symbolized life eternal, and in Norse mythology the evergreens symbolized the revival of Balder, who was the beloved god of the sun.

One story is that the custom of the Christmas tree dated from 1604 at Strasbourg, then in Germany, and was introduced into France and England around 1840 and brought into America in 1847. However, there is evidence that a Christmas tree existed in Philadelphia as early as 1834 and that a spruce was possibly cut at Chicago's old Fort Dearborn during the Christmas celebration there in 1804. There is now evidence, indeed, that in England, as early as 1444, in preparation for the Christmas festivities, the streets, churches, and houses in London were decorated with evergreen.

The fir has often been considered the real Christmas tree. It was reported that in the Hartz Mountains of Germany the girls danced about a fir tree in religious festivals, singing songs and decorating the tree with lights, flowers, eggs, and gewgaws. As they encircled the tree, they prevented the escape of an imp concealed among the branches, who had to give them whatever he had in his keeping or give up hope of going free. The imp, grown up to become the benevolent St. Nicholas, Santa Claus, or Old Nick, is believed by various students of folklore to be none other than Odin himself, Christianized somewhat out of likeness.

The story has it that when a tree is lighted up on Christmas Eve, one must make sure it is a fir and not a pine, spruce, or hemlock in order to learn one's fate, if one has the courage to look at his shadow on the wall. If the shadow appears without a head, it is supposed to signify that one is to die within the coming year. If a branch is cut off and laid across the foot of the bed, it is supposed to keep away nightmare. A stick of fir, not quite burned through, is reputed to keep away lightning, and a bunch hung at the

AMERICAN MISTLETOE

Phoradendron flavescens, a parasitic flowering plant native of the United States, is commonly used in wreaths and at Christmas parties. It is related to the European or true mistletoe (Viscum album) of the legend.

barn door is supposed to keep out evil spirits that want to steal the grain.

Holly and Mistletoe

Interesting too are the legends revolving around two other plants, holly and mistletoe, commonly associated with Christmas. The association of holly and mistletoe with Christmas is believed to be traced back to the time when there was no Christmas and the pagan "festival of the sun," or Yuletide, was celebrated. Yuletide, the turning of the sun in its winter solstice, was celebrated as far back as 2000 B.C. by fire-worshippers of Persia and India. They are known to have venerated the holly and to have used it in their rites. They believed that the holly tree cast no shadow and that it was highly efficacious to sprinkle the face of a newly born child with water impregnated with the bark of the holly. According to tradition, this was the bush in which Jehovah appeared to Moses.

Writing in the *American Botanist* (Vol. 29, 1923, pp. 157–159), Mary M. French says: "It was in the days of the Druids, however, that we find the holly and mistletoe treated with peculiar veneration and credited with supernatural powers. They attached special significance to mistletoe, particularly when it was discovered growing on an oak tree. When such a growth was found it was gathered by the priests who, ceremoniously clad in robes of white, employed all the rites essential to so solemn an occasion. For the ceremony a golden sickle was used—a sickle which was never used for any other purpose. This highly prized mistletoe was sent to various important families with appropriate Yuletide greetings. The recipients of this token of appreciation were expected to reciprocate with timely and generous contributions.

Used by Ancient Romans

"It is interesting to find that holly was used in the Saturnalia of the Romans which was celebrated in December when the sun began its upward course and corresponded to Yuletide. When the Christians began to celebrate the birthday of Christ it is said that they too used holly in order that they might not appear conspicuous among the Saturnalians. . . .

"Holly has been the subject of much superstition and legend. Pliny says that holly planted about a home serves as a charm and keeps away all ill spells, and also guards against any misdirected bolts of lightning. It was popularly believed in the Middle Ages that witches used holly in the manufacture of their midnight spells and incantations. Berries from holly and

POINSETTIA

Euphorbia pulcherrima. The bright red bracts surrounding the flowers make this one of our showiest Christmas plants, often used as a gift.

juniper and mistletoe were employed to form a witch's chain, each link being finished with an acorn. In those times, and even to this day in some parts of rural England, it was considered unlucky to bring holly into the house before Christmas Eve. It was also considered very unlucky not to have the holly taken down before Candlemas Eve. . . .

Mistletoe and Magic

"Mistletoe was long supposed to have magic power. Certainly the withered spinster who found herself bussed beneath its white berries must have believed devoutly in its magic—a magic rite which has been passed down through the centuries. According to the old Norse legend, it was a spear tipped with mistletoe that was used to kill Balder, the sun god. It had been sworn that nothing 'that springs from fire, air, earth, or water' should hurt this celestial favorite. So the wicked and ingenious Loki, hating this Apollo of the North, made an arrow of mistletoe which he gave to blind Hades to test. The god of darkness shot the arrow and killed Balder. At the urgent pleading of all the gods and goddesses Balder was soon restored to life, and mistletoe was thereafter given into the keeping of the Goddess of Love . . .

"From such a background of beneficence it was not unnatural later to find mistletoe considered a sovereign remedy for all diseases. It was employed for epilepsy and convulsions. Holly was also believed to have great medicinal powers, although there may be found no authentic record of any remarkable cures it effected."

Kinds of Christmas Plants

In the United States it may be noted that each section of the country has its own favorite Christmas plants, depending upon the species that grow conveniently at hand or that have been shipped in long enough for the people to become accustomed to them. By and large, the conifers, as a class, supply us with most of our Christmas trees, true firs (Abies), Douglas fir (Pseudotsuga), and spruce (Picea) being preferred to all others. Although balsam fir (Abies balsamea) at one time led in popularity as a Christmas tree and is especially prized at present in the northeastern states, it has in recent years been supplanted in various sections of the country by Douglas fir (Pseudotsuga taxifolia), a relative newcomer to the scene.

Douglas fir is native to the forests of the Pacific Coast and Rocky Mountain region. One of the most important centers of Christmas tree production and of Douglas firs in the United States is Eureka, Montana, located in the Rockies. It is reported that 155 freight carloads of Douglas firs were shipped from this center in 1948. Both the true firs and Douglas fir can be readily distinguished from the spruces by their stalkless needlelike leaves, whereas the spruces have leaves provided with stalks.

There are many kinds of firs and spruces. About 40 different species of true firs (Abies) are known. They range through temperate regions of the northern hemisphere reaching south into Guatemala, North Africa, and the Himalayas. At least two species, the balsam fir (A. balsamea) and the silver fir (A. concolor), are commonly used in this country for Christmas trees, the former more plentifully. Of the spruces, about 40 species are likewise known as inhabitants of the countries of the northern hemisphere. They make excellent Christmas trees because their stiffer, densely leafy twigs are easier to trim than those of the softer balsam fir and their symmetrical horizontal whorled branches form a beautiful pyramidal shape. They do shed their leaves sooner than the firs, however, because their stalked leaves separate from the stalks, but generally they retain their leaves long enough to last over most of the holidays.

BALSAM FIR

Abies balsamea, the most highly prized Christmas tree of the northeastern United States and one of the most popular of all the Christmas trees. It is very similar to the European or silver fir (Abies alba), the fir of European Christmas-tree legends.

Some of the spruces most commonly used at Christmas in this country include the Norway spruce (Picea Abies), a native of Europe but commonly planted in this country, white spruce (P. glauca), native of the northern United States, Colorado blue spruce (P. pungens), native of the Rocky Mountains, and red spruce (P. rubens), native of the eastern United States. Although five species of the Douglas fir group (Pseudotsuga) are known, only one (P. taxifolia) is native to North America, being found in the West, while the other four species inhabit eastern Asia.

Other conifers are often used as Christmas trees in the United States.

Plants other than conifers are sometimes used as Christmas trees in this country. In the southwestern states, for example, some of the huge treelike cacti near dwellings are decorated and lighted up. In New Orleans it is customary to hang lights on the branches of the hackberry or sugartree.

Besides the varieties of trees mentioned above commonly used as Christmas trees, many other plants in this country play an important role in decoration for the Christmas festivities—for sprays, wreaths, bouquets, and mantle or table decorations. In addition to holly and mistletoe, which are the most popular in this country, plants on the following list are widely used in the United States, each section commonly using the material most abundant or indigenous to that particular area. Of evergreen types of leaves a partial list includes ground pine (species of Lycopodium), ground hemlock or yew (Taxus canadensis), often used as a strong backing for large wreaths, juniper (Juniperus virginiana) for smaller wreaths, hemlock (Tsuga canadensis), its fine feathery needles and small cones being especially suited for use in sprays, laurel or sweet bay (Laurus nobilis), and Christmas fern (Polystichum acrostichoides).

Plants Used in Other Countries

Since the Christmas tree ceremony and customs of decoration connected with the festivities are largely associated with European tradition, we find that European countries and those influenced by European or Christian legends have their particular Christmas tree plants that they hold in great esteem and sanctity. In Europe the silver or European fir (Abies alba), of Christmas tree legend and the species that has been used for centuries in Europe as the Christmas tree, is the one most commonly decorated. It has many characteristics in common with our balsam fir, a fact that may have helped develop the high regard in this country for the balsam fir and to rate that species as the foremost Christmas tree of the northeastern United States. Europe does not possess Douglas fir (Pseudotsuga) but does have a number of species of spruce, of which the Norway spruce (Picea Abies) is the best known and most frequently used. The holly, of course, is

(*Continued on page 12, column 1*)

HOVEY MUSEUM FOSSILS RECEIVED HERE

The Museum recently purchased the major part of the fossil collections of the Hovey Museum of Wabash College, Crawfordsville, Indiana. The specimens are now being unpacked, accessioned, and added to the study collection of the Department of Geology. Among a small number of vertebrate fossils is the type specimen of a primitive American camel, *Procamelus hesternus* (Leidy). Invertebrate fossils constitute most of the collection, including many fine specimens of Mississippian crinoids from Crawfordsville, a classic locality from which complete specimens were taken in great abundance two generations ago. There are few places where one may collect complete fossil crinoids, as these strange animals almost invariably disintegrate into millions of tiny pieces of crystalline calcite upon death unless buried rapidly in perfectly still water. The classic localities such as Crawfordsville are now almost entirely "worked out," so that it is a rare stroke of fortune to come upon a quantity of pristine specimens from such a place now.

The Hovey Museum was named for Edmund Otis Hovey, one of the founders of Wabash College, where he taught the courses in natural science. It was he who discovered the famous crinoid beds of Crawfordsville and presumably collected most of the fine crinoid specimens included in the collection. His grandson, with the same name, became a distinguished paleontologist and curator of geology at the American Museum of Natural History, New York, but had no recorded connection with the Hovey Museum. Both grandfather and grandson were original fellows of the Geological Society of America.

For the second time, the Department of Geology is assimilating the fossils of a small Indiana museum. In 1923, Mrs. George W. Robb presented the collections of the Borden Museum, of Borden, Indiana. The Borden collection, even larger than the Hovey collection, also includes many fine crinoids from Crawfordsville.

Before 1883, the Hovey Museum occupied a wing of Center Hall on the campus of Wabash College. It achieved a period of glory between 1883 and 1890 when it was located in the old college gymnasium. With the return of the gymnasium building to athletic activities in 1890, the specimens were scattered among classrooms and laboratories, and when geology was dropped from the curriculum in 1916, little use remained for the collection. In the study collection at Chicago Natural History Museum these fossils will henceforth be available for any scholar to examine and will facilitate the work of the Department of Geology in making determinations of fossils submitted for identification.

It is desired to express the appreciation of the Museum to Dr. Frank Sparks, President of Wabash College, and to Dr. Eliot Williams of that college's Department of Zoology, for their action in making available to the Museum and to research scientists for all time to come the splendid specimens comprising the Hovey collection.

EUGENE S. RICHARDSON, JR.
Curator of Fossil Invertebrates

DECEMBER LECTURE TOURS, DAILY EXCEPT SUNDAY

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays. A schedule of these follows:

Fri., Dec. 1—Natural History of the Chicago Area. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Dec. 6—Designs in Wood—Tree Growths that Result in Beautiful Patterns (*Miriam Wood*).

Fri., Dec. 8—The Earth Blows Her Top—Story of Volcanoes. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Wed., Dec. 13—Sacred Animals (*Jane Sharpe*).

Fri., Dec. 15—Trademarks of Culture. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., Dec. 20—Earth's Natural Resources (*Anne Stromquist*).

Fri., Dec. 22—Toys. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Dec. 27—Web of Life—Interdependence of Plants and Animals (*Marie Svoboda*).

Fri., Dec. 29—Your Winter Vacation in Cuba—Natural History. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Persons wishing to participate should apply at North Entrance. Tours are free. The Museum will be closed on Christmas and New Year's Day.

4-H Club Youths Throng Museum

Boys and girls from the farms of America, chosen in each state for excellence of achievement and sent to Chicago at the time of the International Livestock Exposition as delegates to the National Congress of 4-H Clubs, made their annual visit to Chicago Natural History Museum on November 27 and 30. Several hundred teen-agers and younger members of the rural organization came to the Museum on each day. Special programs were presented for them in the James Simpson Theatre by the Raymond Foundation, after which they made tours of the exhibition halls.

EXPEDITION TO MARIANAS COMPLETES WORK

Dr. Alexander Spoehr, Curator of Oceanic Ethnology, has just returned to the Museum after completion of the Museum's 1949–50 Anthropological Expedition to the Marianas Islands. Except for Guam, the Marianas Islands formerly were a part of the Japanese mandate. Today they are administered by the United States as a United Nations trust territory. The purpose of the Museum expedition was twofold: (1) an archaeological project, designed to uncover the ancient history of the Marianas before Magellan's discovery of Guam in 1521, and (2) an ethnological project whose purpose was the study of the modern native communities on the islands north of Guam. During the war, the Chamorros (the name of the local inhabitants) lost all their possessions and their lives were completely disrupted. Today, under American administration, they are attempting to construct new communities. A principal purpose of the expedition was to examine the process of the reformation of community life and to assess the nature of the problems that remain to be solved by these people. The project was conducted in co-operation with the Navy Department, which at present administers the trust territory. During the year's work of the expedition, headquarters were maintained at Saipan.

A comprehensive account by Dr. Spoehr of the results of the expedition will be printed in an early issue of the BULLETIN.

STAFF NOTES

Dr. Sharat K. Roy, Chief Curator of Geology, **Robert K. Wyant**, Curator of Economic Geology, **Bryan Patterson**, Curator of Fossil Mammals, and **Robert H. Denison**, Curator of Fossil Fishes, attended the Geological Society of America meetings held in Washington, D.C., November 16, 17, and 18. Dr. Roy is continuing his studies on meteorites at both the United States Geological Survey and the U. S. National Museum in Washington .... **Dr. Paul S. Martin**, Chief Curator of Anthropology, will present a paper at the annual meeting of the American Anthropological Association in Berkeley, California, in the latter part of December .... **Miss Elaine Bluhm**, of the Department of Anthropology, lectured on American Indian pottery November 21 at a meeting of the Chicago Potters Guild .... **Robert Kanazawa**, Assistant in Fishes, has resigned to take a position at the U. S. National Museum in Washington, D.C. .... **Loren P. Woods**, Curator of Fishes, and associates in his Division have been making a series of field trips to study cave fishes. Localities thus far visited include southern Indiana, central Kentucky, and Tennessee.

'OLD IRON' FOR TREASURED FURS: INDIAN TRADE IN 1700's

By GEORGE I. QUIMBY
CURATOR OF EXHIBITS, ANTHROPOLOGY

THE SEA OTTER, though probably ignorant of it, was of great importance to the United States, England, China, and the Indian tribes of the Northwest Coast of America (southern Alaska, British Columbia, and Washington). The sea otter was the means by which the English and Americans obtained tea and silk, the means by which the Chinese mandarins obtained fur robes, and the means by which the Northwest Coast Indians obtained iron, brass, copper, tin, civilization, and eventual cultural extinction. For in the last quarter of the 18th century Great Britain and especially the United States were in need of something that could be exchanged for tea and silk in China.

NORTHWEST COAST LANDING, 1778

One of Captain Cook's boats at a Northwest Coast Indian village. Cook complained that the Indians took the ironwork off his boats. (From illustration in 1784 edition of Cook's "Voyages.")

In 1784 the problem was solved by the publication of the account of Captain James Cook's third voyage, in which he showed that there was a Chinese market for sea-otter skins from the Northwest Coast of America. The only remaining problem was how to obtain the sea-otter skins from the Indians of the Northwest Coast. And Cook's publication solved this problem, too. The Northwest Coast Indians would trade anything in exchange for metal, principally iron, brass, and copper.

URGED SHIPBOARD FORGES

The following recommendation to prospective merchants and captains is contained in Cook's *Voyages* (1784, Book IV):

"I would, by all means, recommend, that each ship should have five ton of unwrought iron, a forge, and an expert smith, with a journeyman and apprentice, who might be ready to forge such tools, as it should appear the Indians were most desirous of. For though six of the finest skins purchased by us, were got for a dozen large green glass beads, yet it is well known that the fancy of these people for articles of adornment, is exceedingly capricious; and that iron is the only sure commodity for their markets."

When Captain Cook was exploring the waters of the Northwest Coast and trading with the Indians in 1778 he recorded that the Indians "were more desirous of iron, than any other of our articles of commerce, appearing to be perfectly acquainted with the use of metal" (Cook, 1784, Book VII). Cook goes on to say: "For the various articles which they brought, they took in exchange knives, chissels, pieces of iron and tin, nails, looking glasses, buttons, or any kind of metal. Glass beads they were not fond of, and cloth of every sort they rejected."

FOND OF MIRRORS

The Boston ship *Columbia* attempted in 1788 to trade snuff bottles, rat traps, Jew's-harps, and pocket mirrors for sea-otter pelts. Of this trade cargo, however, the Indians would accept only pocket mirrors. The *Columbia's* trade inventory on her second voyage in 1790 contained 143 sheets of copper, 4,261 quarter-pound iron "chissels," 12 gross metal buttons, a large quantity of nails, and 100-odd muskets and blunderbusses (Morrison, 1925).

Returning once more to the journals of Captain Cook, there is the following statement (Book VII):

"Nothing would go down with our visitors but metal; and brass had by this time, supplanted iron, being so eagerly sought after, that before we left this place, hardly a bit of it was left in the ships, except what belonged to our necessary instruments. Whole suits of clothes were stripped of every button; bureaus of their furniture; and copper kettles, tin cannisters, candlesticks, and the like, all went to wreck; so that our American friends got a greater medley and variety of things from us, than any other nation whom we had visited in the course of the voyage."

RESORTED TO STEALING

It is obvious from the above accounts that the Indians' desire for metals made iron, brass, copper, and tin an ideal medium of exchange in the fur trade. But when the trading was slack or furs were wanting or perhaps for some other reasons, the Indians helped themselves to metal. This aspect of Northwest Coast Indian behavior is documented by the following complaints of Captain Cook (Book VII):

"However, their eagerness to possess iron and brass, and, indeed, any kind of metal, was so great that few of them could resist the temptation to steal it whenever opportunity offered.

"They were thieves in the strictest sense of the word, for they pilfered nothing from us, but what they knew could be converted to the purposes of private utility, and had a real value according to their estimation of things. And it was lucky for us that nothing was thought valuable by them, but the single articles of our metals. Linen and such like things, were perfectly secure from their depredations; and we could safely leave them hanging out ashore all night, without watching.

"We soon discovered by this nearer intercourse, that they were as light-fingered as any of our friends in the islands we had visited in the course of the voyage. And they were far more dangerous thieves; for, possessing sharp iron instruments, they could cut a hook from a tackle, or any other piece of iron from a rope, the instant our backs were turned. A large hook weighing between twenty and thirty pounds, several smaller ones, and other articles of iron were lost in this manner. And as to our boats, they stripped them of every bit of iron that was worth carrying away, though we had always left men in them as a guard.... One would contrive to amuse the boat-keeper, at one end of the boat, while another was pulling out the iron work on the other."

THE CHIEF'S 'BARGAIN'

The value of metal to the Indians is shown not only by the fact that they stole it or

were willing to trade for it but also by what was traded for metal. Captain John Meares of the trading ship *Felice Adventurer* reported, "Sometime in October, 1788, his Majesty [an Indian chief] brought us a young woman and offered her for sale; and she was accordingly bought for an axe and a small quantity of glass beads.... She remained with us near four months."

The Boston ship *Columbia* obtained in 1790 from the Haida Indians 200 sea-otter skins for 200 iron chisels, but the Nootka Indians, who had had more experience with traders, demanded ten iron chisels or a sheet of copper six inches square for one sea-otter skin. The armorer on Captain Joseph Ingraham's brigantine *Hope* made ornamental collars and bracelets, each of which was worth three sea-otter skins. Sea-otter skins bought goods in China to the value of $50 each. Thus the trading on the Northwest Coast was very lucrative for everybody concerned.

HOW METAL WAS USED

It has just been shown that the Northwest Coast Indians wanted metal and that American and English traders supplied it in quantity. Here are some examples of the ways in which the Indians used the metals:

Axes and chisels of iron were hafted to wooden or bone handles and used as cutting or planing adzes. The Northwest Coast Indians did not use axes of stone before the arrival of the traders, but had used stone adzes; and thus they even hafted axe blades for use as adzes. Iron knives and arrow heads were used in place of the older stone and bone types. Iron muskets and blunderbusses in part replaced bows and arrows.

A number of uses of metal were ceremonial, ornamental, or symbolic of prestige. For instance, Captain Cook records that he saw an Indian wearing two Spanish spoons of silver around his neck. Another example of the use of ornaments is Captain Ingraham's iron collars and bracelets that became so popular. Captain Meares' account of the arrival of Comekela, a Nootka Indian, at Nootka Sound after a passage from China on Meares' ship provides an excellent example of the use of metals for purposes of ornament and prestige:

"His scarlet (regimental) coat was decorated with such quantities of brass buttons and copper additions of one kind or other, as could not fail of procuring him the most profound respect of his countrymen, and render him an object of the first desire among the Nootka damsels. At least half a sheet of copper formed his breastplate; from his ears copper ornaments were suspended, and he contrived to hang from his hair, which was dressed en queue, so many handles of copper saucepans, that his head was kept back by the weight of them, in such a stiff and upright position, as very much to heighten the singularity of his appearance. For various articles of his present pride Comekela had been in a state of continual hostility with the cook, from whom he had contrived to purloin them, but their last and principal struggle was for an enormous spit, which the American had seized as a spear, to swell the circumstances of the Magnificence with which he was on the moment of dazzling the eyes of his countrymen;—and situated as we were, this important article of culinary service could not be denied him. In such a state of accoutrement, and feeling as much delight as ever fed the pride of the most splendid thrones of Europe or the East, we set out with him for the shore, when a general shout and cry from the village assured him of the universal joy which was felt on his return.

"The whole body of inhabitants moved towards the beach, and with a most unpleasant howl, welcomed him on shore. . . . After the first ceremonies of welcome were over the whole company proceeded to the king's house, into which persons of rank were alone permitted to enter, and where a magnificent feast of whale blubber and oil was prepared."

NECKLACES OF KEYS

Other objects used for ornament and prestige were copper teakettles that were never used and bunches of old polished keys worn as necklaces (Morrison). Captain Cook wrote that one of the chiefs was presented with a "new broad-sword with a brass hilt," probably for use as an ornament.

INDIAN METAL CRAFTSMANSHIP

Tools, weapons, and ornaments showing what the Northwest Coast Indians did with iron and copper obtained by trade.

Metal was even used in place of a carved ceremonial mask, for, according to Cook (Book VII), "So fond are they of these disguises that I have seen one of them put his head into a tin kettle he had got from us, for want of another sort of mask."

Another example of the use of a metal object for ceremonial purposes is cited by Meares, who reported in 1788 that Maquilla, a Nootka chief, had "a brass mortar, left by Captain Cook which was held in the highest degree of estimation by the Nootka chief. This piece of culinary furniture was elevated from a state of servile use, to become a symbol of royal magnificence. It was kept extremely bright, and, in visits, or meetings of ceremony, it was borne before Maquilla, to aid the splendor of the regal character."

The Northwest Coast Indians seem to have had a desire for metals that transcended mere recognition of utility and superiority over stone, bone, and shell. In fact, their desire for metal seems compulsive to the point of being unreasonable. The Indian desire for metal is, however, understandable in the context of their cultural pattern, which emphasized symbolic wealth, class prestige based on wealth and birth, warfare, and skill in woodcarving.

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FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

Publications.—During 1900 ten publications were issued and also the second part of Professor Charles B. Cory's *The Birds of Eastern North America.* The total number of pages published amounted to 547.

In comparison, the Annual Report for 1949 states that twenty-two titles were published in the Scientific Series and one in the Administrative Series. The total number of pages printed in all books, including an index for one completed volume in the Scientific Series, was 2,694.

Accessions. "The purchase of the Patterson herbarium containing 30,000 specimens of North American plants was a most noteworthy contribution to the Department of Botany." *This was the third major collection obtained by the Museum, the first being the Schott Collection of 8,500 specimens, the second the Bebb Collection of 30,000 plants.*

BORNEO EXPEDITION BACK—

(*Continued from page 3*)

people imagine the jungle as crawling with snakes, but we encountered scarcely a dozen even though we were looking for them. The forest is not an impenetrable tangle through which a path must be hacked with knife or ax. On the contrary the shade of the giant trees is so dense that few plants can grow beneath them and the forest is open and almost parklike. The aborigines, sometimes described as blood-thirsty head-hunters, we found to be amiable companions, trustworthy and capable. The only survival of the head-hunter's art that we saw was a gift of a gibbon skull, flower-bedecked and decorated exactly like the human skulls that once were prized, and gruesomely reminiscent of that vanished custom.

But the Museum—and science in general—is not interested in things merely because they are bizarre or rare. A two-headed calf is likely to be less useful to a biologist than one with the customary single head; and a frog from Borneo is not necessarily more interesting than one from Chicago. Biological research in the tropics is rewarding chiefly because under lush tropical conditions many of the life processes biologists are trying to understand are intensified so that things that might be inconspicuous elsewhere are often exaggerated and relatively obvious there.

EVOLUTIONARY BY-PATHS

Perhaps the most important biological problem today is the incredibly intricate mechanism of evolution—how the changes that we know have taken place during the history of animal life were actually brought about. Some aspects of this wonderfully complex problem can be studied only in the tropics, just as other aspects can be studied only in a well-equipped laboratory or by digging fossils from the ground. Biological research in the tropics, like scientific research anywhere, is mostly an uninspiring routine of accumulating facts, with only occasional flashes of thrilling discovery. For every minute of excitement there are hours of taking temperature and humidity readings, checking rain gauges, rearing tadpoles, dissecting out stomachs, endless skinning, or just plain slogging through the steamy forest. For the mere adventurer the rewards are scant and soon exhausted.

The expedition collected more than 350 mammals, by far the largest collection of North Bornean mammals in existence, nearly 500 birds, several hundred reptiles and amphibians, and several thousand fishes, insects, and other invertebrates. More than 100 skeletons and numerous anatomical preparations were made. Many parasites, which are important in transmitting tropical diseases, were collected and preserved. The expedition made about 500 photographs, 200 of them in color, and 600 feet of motion picture film.

It is a pleasure to acknowledge the Museum's indebtedness to various organizations in Sandakan for their whole-hearted co-operation with the Borneo Zoological Expedition. The Forestry Department, the Fisheries Department, and North Borneo Timbers, Ltd., were constantly helpful, and without their assistance the expedition would have been far less effective.

COMMENTS OF DARWIN ON USE OF WORDS

I have read your paper with much interest. You ask for remarks on the matter, which is alone really important. Shall you think me impertinent (I am sure I do not mean to be so) if I hazard a remark on the style, which is of more importance than some think? In my opinion (whether or not worth much), your paper would have been much better if written more simply and less elaborated—more like your letters. It is a golden rule always to use, if possible, a short old Saxon word. Such a sentence as "so purely dependent is the incipient plant on the specific morphological tendency" does not sound to my ears like good mother-English—it wants translating. Here and there you might, I think, have condensed some sentences. I go on the plan of thinking every single word which can be omitted without actual loss of sense as a decided gain. Now perhaps you will think me a meddling intruder: anyhow, it is the advice of an old hackneyed writer who sincerely wishes you well.

CHARLES DARWIN, Letter to John Scott, Dec. 11, 1862, *More Letters of Charles Darwin*

'CAVEMAN SCANDAL' BARED BY LAYMAN LECTURER

"The Caveman Knew His Way Around" is the title of the second lecture in the new series of programs on Sunday afternoons by Paul G. Dallwig, the Layman Lecturer. This subject will be presented on four Sundays of this month (December 3, 10, 17, and 31—because of Christmas Eve *there will be no lecture on Sunday, December 24*).

In this lecture Mr. Dallwig presents the story of our caveman ancestors. He will describe their physical and cultural development, with special attention to prehistoric art. The lecture will be illustrated with the life-size dioramas in the Hall of the Stone Age of the Old World—the Neanderthal family, Cro-Magnons, Sun-Worshippers, and others. Mr. Dallwig's dramatizations of his subjects, which have made his lectures so popular, will in this instance include the story of a prehistoric murder as it may have occurred, the result, perhaps, of jealousy. The victim was a "beautiful" young Magdalenian woman of about 20,000 years ago whose skeleton is on exhibition in the Museum.

The lecture will begin at 2 P.M. and end at 4:30 P.M. Midway there will be an intermission for tea and other refreshments in the Museum Cafeteria. In January Mr. Dallwig's subject will be "Living Races and Their Way of Life."

Members of the Museum may use their membership cards to attend these lectures without advance reservations. All others, except out-of-town visitors and representatives of the press, must make advance reservations to attend the Sunday lectures. Reservations may be made by mail or telephone (WAbash 2-9410). The lectures are free.

CHRISTMAS SHOPPING MADE EASY: YOU NEEDN'T STIR FROM YOUR HOME

There are two easy ways to do your Christmas shopping with the help of Chicago Natural History Museum. Both not only eliminate the struggle with holiday crowds in store aisles but also save you the trouble of wrapping and mailing parcels. Here they are:

(1) Christmas Gift Memberships

Send to the Director the name and address of the person to whom you wish to give a Museum membership, together with your remittance to cover membership fee or dues.

An attractive Christmas card will notify the recipient that through your generosity he has been elected a Member of the Museum. He will receive also his membership card or certificate and information on membership privileges.

(2) Museum Book Shop Gifts

Books endorsed for scientific authenticity by members of the Museum staff are on sale in the BOOK SHOP. The selection is for both adults and children.

Where desired, the BOOK SHOP will handle orders by mail and telephone (WAbash 2-9410) and will undertake all details of wrapping and dispatching gift purchases to the designated recipients, together with such personal greetings as the purchaser may specify.

CHRISTMAS PLANTS—

(*Continued from page 7*)

commonly used in Europe. The native species there, however, is the European holly (Ilex Aquifolium), which is cultivated in the northwestern section of the United States. The European or true mistletoe (Viscum) belongs to an entirely different genus than the American representative, the latter being a species of the genus Phoradendron.

In Latin America the Christmas holidays are not nearly as important to the inhabitants as are the Easter holidays. The decoration of Christmas trees in these Latin American countries is participated in mostly by the wealthy class or by those living in the larger cities. European species, such as the fir (Abies alba) and Norway spruce (Picea Abies), are frequently brought in to Argentina and Colombia from Germany and are sold to a small part of the population. Most of the native inhabitants, however, who live away from the larger towns and cities, do not follow the custom of setting up Christmas trees or otherwise decorating their homes for the occasion. In some parts of Latin America coffee trees (Coffea arabica) have been observed in use as Christmas trees.

Various other plants native to other sectors of the world are likewise used for Christmas. In New Zealand a tree known as pohutukawa (Metrosideros tomentosa), often acknowledged to be the most magnificent tree of that country, has branches covered from base to summit with large sprays of deep red flowers. These contrast strongly with the white lower-leaf surfaces. The people of New Zealand use these flowers freely for Christmas decorations. In Australia the western Australia Christmas tree (Nuytsia floribunda), a small tree with reddish-yellow flowers is used.

A number of other plants, in addition to those noted above, are intimately associated with the Christmas festivities. Some are used because of their decorative fruit colors, while others are often useful as gift plants.

Among the commonest Christmas gift plants are the poinsettia (Euphorbia pulcherrima), azalea (Rhododendron indicum), cyclamen, African violet, ornamental pepper (Capsicum), winter-flowering begonia, kalanchoe, dwarf oranges, Christmas cactus, and the florist's heather (Erica). The pomegranate fruit, when wired to Christmas greens, supplies a striking red color and provides an interesting deviation in fruit flavor. The Chinese Christmas berry (Photinia villosa) provides good Christmas decoration with its attractive red fruits. The Christmas rose (Helloborus niger) is an ornamental garden plant growing eight to ten inches tall. It often blooms outdoors around Christmas time and is conspicuous with its large white flowers nearly two inches across.

The use of native material for Christmas decoration is to be commended as long as the supply is plentiful. It is, of course, "wholly out of keeping with the Christmas spirit," as one conservationist has expressed it, to be the collector of the last surviving bittersweet, Christmas fern, or ground pine in your neighborhood. Such plants should, wherever rare, be left for future generations to enjoy at Christmas and other seasons.

[The author expresses indebtedness to Miss Edith Vincent, of the Department of Botany, for her kind assistance in securing literature necessary for preparation of this article.]

MERRY CHRISTMAS and HAPPY NEW YEAR

The Museum will be closed on both Monday, December 25, and Monday, January 1 (Christmas and New Year's Day), so that Museum employees may spend the holidays with their families. These are the only days in the year when the Museum is not open.

Technical Publications Issued

The following technical publications were issued by Chicago Natural History Museum recently:

Fieldiana, Anthropology, Vol. 38, No. 3. *Sites of the Reserve Phase, Pine Lawn Valley, Western New Mexico.* By Paul S. Martin and John B. Rinaldo. October 18, 1950. 180 pages, 79 text figures.

Fieldiana, Zoology, Vol. 31, No. 39. *Report on a Collection of Birds from Guerrero, Mexico.* By Emmet R. Blake. November 3, 1950. 20 pages.

NEW MEMBERS

The following persons became Museum Members between October 16 and November 15:

Associate Members

Mrs. Ann Bigelow, Frank J. Jonak

Annual Members

Miss Helen Anthony, Martin E. Benson, Marcus E. Borinstein, Charles W. Bryan, Jr., Oliver M. Burton, Horace G. Butler, Overton S. Chambers, John D. Clancy, Jr., Dr. C. L. Crean, Mrs. Doris Coleman Gans, Miss Marion Hanson, Mrs. William J. Haskins, J. E. Keller, E. Fred Lechler, Arthur Lehr, Mrs. Theris V. McCarthy, Dr. Helen Vincent McLean, John W. Miller, Miss Eleanor O. Olaison, Albert Z. Orstrom, A. A. Schwartz, Edward H. Schwartz, Fred W. Skirrow, George F. Thiry, Jay C. Williams, Mrs. Victor K. Zurcher.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received recently:

Department of Botany:

From: Donald Richards, Chicago—89 Swedish lichens, Sweden; Dr. Valerie May, Sydney, Australia—14 herbarium specimens, New Caledonia; New York Botanical Garden, New York—165 Cinchona specimens, Ecuador; Dr. Walter Kiener, Lincoln, Neb.—44 specimens of algae, Nebraska; University of California, Berkeley—298 specimens of algae, Puerto Rico and Wyoming; William L. Culberson, Cincinnati—39 cryptogams, Ohio and Kentucky; Archie F. Wilson, Flossmoor, Ill.—2 Korean plants; J. Francis Macbride, Palo Alto, Calif.—44 unmounted Peruvian plants.

Department of Zoology:

From: Harry Hoogstraal, Cairo, Egypt—301 mammals, 194 frogs, lizards, and snakes, and 6 fresh-water invertebrates, Egypt and Anglo-Egyptian Sudan; Chicago Zoological Society, Brookfield, Ill.—5 mammals and an egg of the blue bird of paradise; N. L. H. Krauss, Honolulu, Hawaii—3 lizards, Canton and Phoenix Islands; Luther Little, San Marino, Calif.—4 bats, Arizona; Walther Buchen, Chicago—4 bats, Africa; Dr. Charles A. Reed, Chicago—142 salamanders, Arizona; Mrs. Howard C. Spencer, Vernon, N.J.—4 wood turtles, New Jersey; Walter F. Webb, St. Petersburg, Fla.—2 specimens of fresh-water shells, Peru; Capt. Felix Cardona, Caracas, Venezuela—219 insects, Venezuela; Henry S. Dybas, Hazelcrest, Ill.—1,428 insects and allies; Ronald Ward, Chicago—3 water beetles and 100-plus bird mites, United States; August Ziemer, Chicago—143 insects, Illinois and Wisconsin; Dr. Hurst Shoemaker, Champaign, Ill.—a deep-water snail shell, Gulf of Mexico; Dr. Don Lowrie, Moscow, Idaho—400 spiders of 71 species, Wisconsin; Laura Brodie and Margaret Bradbury, Chicago—123 salamanders and 88 frogs, South Carolina; Dr. and Mrs. Clarence Goodnight, Lafayette, Ind.—82 insects, Mexico; Harry Nelson, Chicago—80 insects, Missouri; Alan and Bryan Patterson, Park Forest, Ill.—40 insects, Illinois; Dr. Charles Remington, New Haven, Conn.—379 beetles, Philippine Islands; E. W. Eigsti, Hastings, Neb.—34 insects, Nebraska; Dr. Charles H. Seevers, Chicago—138 insects, North America; Bro. Niceforo Maria, Pamplona, Colombia—a bird skin, Colombia; Richard E. Tashian, Lafayette, Ind.—83 bird skins, Mexico; Lillian Ross, Chicago—126 insects and allies, Cuba and the United States; Hsiu-fu Chao, Amherst, Mass.—a paratype of a damsel-fly, China; Dr. Henry Kirby-Smith, Sewanee, Tenn.—7 miscellaneous fresh-water fishes from Big Boat Cave, Tenn.; Col. George W. Hunter III, San Francisco, Calif.—2 frogs, Japan; New York Zoological Society, New York—a bird specimen; Maj. Robert Traub, Washington. D.C.—28 bats, Malaya.

Library:

From: Dr. Walter C. Alvarez, Rochester, Minn.; Dr. Henry Field, Washington, D.C.; Mayuyama and Co., Tokyo, Japan.

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